I

THE

AMERICAN JOURNAL

OF THE

MEDICAL SCIENCES.

EDITED BY

ISAAC HAYS, M.D.,

FELLOW OF THE PHILADELPHIA COLLEGE OF PHYSICIANS; MEMBER OF THE
AMERICAN MEDICAL ASSOCIATION; OF THE AMERICAN PHILOSOPHICAL SOCIETY; OF THE
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TO READERS AND CORRESPONDENTS.

The communications of Prof. Dalton, Drs. Read, Irwin, Griscom, Prince, Hitchcock, and Bradford are on file for publication.

The following works have been received:—

The History of Medicine; comprising a narrative of its progress from the earliest ages to the present time, and of the delusions incidental to its advance from empiricism to the dignity of science. By Edward Meryon, M.D., F.G.S., &c. &c. &c. Vol. I. London: Longman & Co., 1861. (From the Author.)

Transactions of the Obstetrical Society of London. Vol. II. For the year 1860. London: Longman & Co., 1861. (From the Society.)

Relatorio do Gabinete Estatistico Medico-Cirurgico do Hospital Geral da Santa Casa de Misericordia e Enfermarias publicas apresentado ao Ex^mo^ Sr. Marquez D'Abrantes Provedor da Santa Casa. Pelo Dr. Luiz da Silva Brandao, Director do Gabinete Estatistico Medico Effectivo do Hospital do Santa Casa da Miseracordia, &c. &c. &c. Rio de Janeiro, 1860. (From Dr. de Cunha, of Rio de Janeiro.)

Another Letter to a Young Physician; to which are appended some other Medical Papers. By James Jackson, M.D., Professor Emeritus of Theory and Pract. Med. in Harvard University. Boston: Ticknor & Fields, 1861. (From the Author.)

Handbook for the Military Surgeon. By Charles S. Tripler, A.M., M.D., Surgeon U. S. A.; and George C. Blackman, M.D., &c. Cincinnati: Robert Clarke & Co., 1861. (From the Publishers.)

A Manual of Military Surgery; or, Hints on the Emergencies of Field, Camp, and Hospital Practice. Illustrated with wood-cuts. By S. D. Gross, M.D., Prof. Surg. Jeff. Med. College. Philad.: J. B. Lippincott & Co., 1861. (From the Publishers.)

A Practical Treatise on Military Surgery. By Frank Hastings Hamilton, M.D., Prof. Military Surgery and Diseases and Accidents incident to Bones in Bellevue Hospital, &c. &c. &c. New York: Baillière & Bros., 1861.

A Treatise on the Practice of Medicine. By Edwin R. Maxon, M.D., formerly Lecturer on Insts. and Pract. Med. in Geneva Med. Col. Philadelphia: Lindsay & Blakiston, 1861. (From the Publishers.)

Microscopic Anatomy of the Lumbar Enlargement of the Spinal Cord. By John Dean, M.D. Communicated to the American Academy of Arts and Sciences by Prof. Jeffries Wyman, Nov. 16, 1860. Cambridge, 1861. (From the Author.)

A Paper on Diphtheria. Read before the New York Acad. Med., Jan. 1861. By James Wynne, M.D. New York, 1861.

Proceedings of the Academy of Natural Sciences of Philadelphia, March, April, 1861.

Extracts from the Records of the Boston Society for Medical Improvement. By Francis Minot, M.D., Secretary of the Society. Vol. IV., No. 3. Boston, 1861. (From the Secretary.)

Medical Communications, with the Proceedings of the Sixty-ninth Annual Convention of the Connecticut Medical Society, held at New Haven, May 22 and 23, 1861. Hartford, 1861.

Report of Professor Valentine Mott's Surgical Cliniques in the University of New York, Session 1859–60. By Samuel W. Francis, Member of Dr. Mott's Surgical Staff. New York: S. S. & W. Wood, 1860.

A Book about Doctors. By J. Cordy Jeaffreson. Reprinted from the English edition. New York: Rudd & Carleton, 1861. (From the Publishers.)

Biographical Sketches of Deceased Physicians of Westchester County, New York; being the Annual Address before the Westchester County Med. Society, June, 1858. By Geo. J. Fisher, M.D. New York, 1861. (From the Author.)

Report on Morbus Coxarius or Hip-Disease. By Lewis A. Sayre, M. D. From Trans. Am. Med. Ass. Phil. 1861. (From the Author.)

Our Alma Mater Fifty Years Ago. An Oration delivered before the Alumni Association of the Coll. Phys. and Surg. N. Y., March 14, 1861. By Thomas W. Blatchford, M. D. Troy, N. Y. 1861. (From the Author.)

The Modus Operandi of various kinds of Baths physiologically explained. By John O'Reilly, M. D. New York, 1861. (From the Author.)

The Physician's Pocket Dose and Symptom Book; containing the doses and uses of all the principal articles of the Materia Medica, &c. &c. By Joseph H. Wythes, M. D. Third edition. Philadelphia, 1861. (From the Publishers.)

Fortieth Annual Report of the Surgeons of the New York Eye Infirmary, Second Avenue, corner of Thirteenth Street, for the year 1860. Founded 1820. New York, 1860.

Report of the Board of Commissioners and of the Superintendents of the Provincial Lunatic Asylum of New Brunswick for the year 1860. St. John's, N. B., 1861. (From John Waddell, M. D., Medical Superintendent.)

Tenth Annual Report of the New York Asylum for Idiots. Transmitted to the Legislature Jan. 25, 1861. Albany, 1861.

First Annual Report of the Superintendent of Clifton Hall, a private Hospital for the Insane, to the Board of Supervision, for the year 1860. Philadelphia, 1861. (From Dr. R. A. Given.)

Address to the Graduates of the Medical Department of Pennsylvania College. By B. Howard Rand, M. D., Prof. of Chemistry. Philadelphia, 1861. (From the Author.)

Third Report of the Legislature of Vermont, relating to the Registry and Returns of Births, Marriages, and Deaths, in the State, for the year ending Dec. 31, 1859. Prepared under the direction of Benjamin W. Dean, Secretary of State. Middlebury, 1860. (From H. F. Stevens, M. D.)

Sixth Annual Report on the Births, Marriages, and Deaths in the City of Providence, for the year 1860. With a Recapitulation of the Vital Statistics of the City for the last five years, &c. By Edwin M. Snow, M. D., Superintendent of Health, and City Registrar. Providence, 1861. (From the Author.)

Report of the Board of Managers of the Lunatic Asylum of the State of Missouri to the Twenty-first General Assembly. Jefferson City, Mo., 1861. (From Dr. T. R. H. Smith.)

Provincial Hospital for the Insane, Halifax, Nova Scotia. Third Report of the Medical Superintendent. Halifax, N. S., 1861. (From Dr. J. R. De Wolf.)

Forty-fourth Annual Report on the State of the Asylum for the Relief of Persons deprived of the Use of their Reason. Published by direction of the Contributors. Philadelphia, 1861. (From Dr. J. H. Worthington.)

Report of the Board of Managers of the Pennsylvania Hospital to the Contributors at their Annual Meeting, 5th month, 1861. Philadelphia, 1861.

Fifth Annual Report of the Board of Managers of the Children's Hospital of Philadelphia, 1861.

Report of State Hospital Committee on State Insane Asylum at Stockton, California.

An Address delivered at the Annual Commencement of the Medical School of Harvard University, Wednesday, March 6, 1861. By George C. Shattuck, M. D., Hersey Prof. Theory and Pract. Med. Boston, 1861. (From the Author.)

Catalogue of the Trustees, Officers, and Students of the University of Pennsylvania, Session 1860–61. Philadelphia, 1861.

Circular of the Medical Institution of Yale College, Session 1861–2. New Haven, Conn., May 1, 1861.

Fifty-fourth Annual Circular of the University of Maryland, School of Medicine, Session 1861–2. Baltimore, 1861.

Annual Catalogue and Announcement of the St. Louis Medical College, Session 1861–2. St. Louis, 1861.

The following Journals have been received in exchange:—

Gazette Médicale de Paris. March, April, 1861.

Journal de Médecine de Bordeaux. Redacteur en chef, M. COSTES. Jan., Feb., March, April, 1861.

Le Moniteur des Sciences Médicales et Pharmaceutics. Redacteur en chef, M. H. DE CASTELNEAU. March, April, May, 1861.

Annales Médico-Psychologiques. Par MM. les Docteurs BAILLARGER, CERISE, et MOREAU (de Tours). April, 1861.

The British and Foreign Medico-Chirurgical Review. April, 1861.

The Medical Critic and Psychological Journal. Edited by FORBES WINSLOW, M. D. April, 1861.

Ophthalmic Hospital Reports and Journal of the Royal Ophthalmic Hospital. Edited by J. F. STREATFEILD. Nos. 13 and 14.

Edinburgh Medical Journal. February, March, April, May, June, 1861.

London Medical Review. March, April, May, 1861.

British Medical Journal. March, April, May, 1861.

Dublin Medical Press. March, April, May, 1861.

Medical Times and Gazette. April, May, June, 1861.

The Dublin Quarterly Journal of Medical Science. May, 1861.

Edinburgh Veterinary Review, May, 1861.

The British American Journal. Edited by ARCHIBALD HALL, M. D. April, May, 1861.

The Boston Medical and Surgical Journal. Edited by F. E. OLIVER, M. D., and S. L. ABBOT, M. D. April, May, June, 1861.

American Medical Times. April, May, June, 1861.

The Maryland and Virginia Medical Journal. Edited by J. B. MCCAW, M.D., W. C. VAN BIBBER, M. D., and W. A. HAMMOND, M.D. April, May, 1861.

The North American Medical and Surgical Journal. Edited by Drs. S. D. GROSS, T. G. RICHARDSON, and S. W. GROSS. May, 1861.

Southern Medical and Surgical Journal. Edited by H. F. CAMPBELL, M. D., and R. CAMPBELL, M. D. March, April, 1861.

The Cincinnati Lancet and Observer. Edited by Drs. STEVENS, MURPHY, and WEBER. April, May, June,1861.

The Berkshire Medical Journal. Edited by WM. H. THAYER, M. D., and R. C. STILES, M. D. February, March, April, May, 1861.

The American Journal of Insanity. Edited by the Medical Officers of the New York State Lunatic Asylum. April, 1861.

The New Orleans Medical and Surgical Journal. Edited by BENNET DOWLER, M. D. May, 1861.

The New Orleans Medical Times. Edited by A. PENISTON, M. D. April, May, 1861.

The American Journal of Science and Arts. Edited by Profs. B. SILLIMAN, B. SILLIMAN, Jr., and J. D. DANA. May, 1861.

The Chicago Medical Journal. Edited by D. BRAINARD, M. D., and J. A. ALLEN, M. D. March, April, 1861.

The Savannah Journal of Medicine. Edited by Drs. HARRISS, ARNOLD, and WILSON. April, 1861.

The Chicago Medical Examiner. Edited by N. S. DAVIS, M. D. March, June, 1861.

Atlanta Medical and Surgical Journal. Edited by J. G. WESTMORELAND, M. D. April, May, 1861.

The Pacific Medical and Surgical Journal. Edited by DAVID WOOSTER, M. D. March, April, May, 1861.

Baltimore Journal of Medicine. Edited by E. WARREN, M. D. May, 1861.

Cleveland Medical Gazette. Edited by G. C. E. WEBER, M. D., E. B. STEVENS, M. D., and J. A. MURPHY, M. D. May, June, 1861.

Summary of Medical Science. Edited by W. K. WELLS, M. D. April, 1861.

The Cincinnati Medical and Surgical News. Edited by A. H. BAKER, M. D., and J. A. THACKER, M. D. March, April, May, 1861.

American Medical Gazette. Edited by D. M. REESE, M. D. April, 1861.

Nashville Journal of Medicine and Surgery. Edited by W. K. Bowling, M. D. April, 1861.

St. Louis Medical and Surgical Journal. Edited by M. L. Linton, M. D., and W. M. McPheeters, M. D. May, 1861.

The Medical Journal of North Carolina. Edited by C. E. Johnson, M. D., and S. S. Satchwell, M. D. May, 1861.

American Medical Monthly. Edited by J. H. Douglas, M. D. May, June, 1861.

The Pacific Medical and Surgical Journal. Edited by David Wooster, M. D. February, 1861.

Ohio Medical and Surgical Journal. Edited by John Dawson, M. D., and J. W. Hamilton, M. D. May, 1861.

The American Journal of Pharmacy. Published by authority of the Philadelphia College of Physicians. Edited by Wm. Procter, Jr., Prof. Pharmacy, Phil. Coll. Pharm. March, May, 1861.

The American Druggists' Circular and Chemical Gazette. April, May, June, 1861.

The Druggist. May, June, 1861.

The Dental Cosmos. Edited by J. D. White, M. D., J. H. McQuillen, D. D. S., and Geo. J. Ziegler, M. D. April, May, 1861.

The New York Dental Journal. Edited by W. B. Roberts and F. H. Norton. April, 1861.

The Dental Register of the West. Edited by J. Taft and Geo. Watt. May, 1861.

Communications intended for publication, and Books for Review, should be sent, *free of expense*, directed to Isaac Hays, M. D., Editor of the American Journal of the Medical Sciences, care of Messrs. Blanchard & Lea, Philadelphia. Parcels directed as above, and (carriage paid) under cover, to Messrs. Trübner & Co., Booksellers, No. 60 Paternoster Row, *London, E. C.;* or M. Hector Bossange, Lib. quai Voltaire, No. 11, *Paris*, will reach us safely and without delay. We particularly request the attention of our foreign correspondents to the above, as we are often subjected to unnecessary expense for postage and carriage.

Private communications to the Editor may be addressed to his residence, 1525 Locust Street.

All remittances of money, and letters on the *business* of the Journal, should be addressed *exclusively* to the publishers, Messrs. Blanchard & Lea.

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The Forms, Complications, Causes, Prevention, and Treatment of Consumption and Bronchitis: comprising also the Causes and Prevention of Scrofula. By James Copland, M.D., F.R.S., &c. London, 1861. 8vo. pp. 440.
Leçons Cliniques sur les Causes et sur le Traitement de la Tuberculisation Pulmonaire, faites à l'Hotel Dieu (1859). Par Noel Guéneau de Mussy. Paris, 1860. 8vo. pp. 134.
The Physical Examination of the Chest in Pulmonary Consumption and its Intercurrent Diseases. By Somerville Scott Alison, M.D. London, 1861. 8vo. pp. 447. 137

XI. Sanitary Science.
1. Proceedings and Debates of the Fourth National Quarantine and Sanitary Convention, held in the city of Boston, June 14, 15, and 16, 1860. Reported for the City Council of Boston. Geo. C. Rand and Avery, City Printers. Boston, 1860.
2. Public Health. The Right Use of Records founded on Local Facts; being two papers read before the National Association for the Promotion of Social Science, at Bradford, in October, 1859; with an account of subsequent proceedings. By Henry Wyldbore Rumsey, Author of "Health and Sickness of Town Populations," "Essays on State Medicine," &c. London, 1860. 181

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XIII. A Manual of Human Microscopic Anatomy. By A. Kölliker, Prof. of Anat. and Physiol. in the Univ. of Würzburg. With 249 illustrations. London: J. W. Parker & Son, 1860. 207

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XIV. Hand-book for the Military Surgeon: Being a Compendium of the Duties of the Medical Officer in the Field, the Sanitary Management of the Camp, the Preparation of Food, etc.; with Forms for the Requisitions for Supplies, Rations, etc.; the Diagnosis and Treatment of Camp Dysentery; and all the Important Points in War Surgery: including Gunshot Wounds, Amputation, Wounds of the Chest, Abdomen, Arteries, and Head, and the Use of Chloroform. By Chas. S. Tripler, M.D., Surgeon United States Army. And George C. Blackman, M.D. F. R. M. S., Prof. of Surgery in the Med. Coll. of Ohio, &c. &c. Cincinnati: Robert Clarke & Co., 1861. 12mo. pp. 163, including Appendix of Forms.
A Manual of Military Surgery; or Hints on the Emergencies of Field, Camp, and Hospital Practice. Illustrated with Wood Cuts. By S. D. Gross, M.D., Prof. of Surg. in the Jefferson Med. Coll. of Phila. Philadelphia: J. B. Lippincott & Co., 1861. 24mo. pp. 186.
A Practical Treatise on Military Surgery. By Frank Hastings Hamilton, M.D., Late Surgeon 33d Reg. 4th Brigade 4th Div. N. Y. S. Artillery; Prof. of Military Surgery, &c. &c. New York: Baillière Brothers, 1861. 8vo. pp. 234, including Appendix and Index, with several wood-cuts. . 213

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XVIII. Researches upon the Venom of the Rattlesnake; with an Investigation of the Anatomy and Physiology of the Organs Concerned. By S. Weir Mitchell, M. D., Lecturer on Physiology in the Philadelphia Medical Association. Published by the Smithsonian Institution, Jan., 1861. Pp. 145. With twelve wood-cuts. 229

XIX. A Treatise on the Practice of Medicine. By Edwin R. Maxon, M. D., formerly Lecturer on Institutes and Practice of Medicine in the Geneva Medical College. 8vo. pp. 705. Philadelphia: Lindsay & Blakiston, 1861. 231

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XXI. Guy's Hospital Reports. Edited by Samuel Wilks, M. D., and Alfred Poland. Third Series, Vol. VI. London: 1860. 8vo. pp. 531. . . 232

XXII. Cours Théorique et Clinique de Pathologie Interne et de Thérapie Médicale, par E. Gintrac, Professeur de Clinique Interne et Directeur de l'Ecole de Médecine de Bordeaux, Membre de la Commission Administrative des Hospices Civils, etc. etc. Tomes 4e et 5e, 8vo. pp. 750, 821. Paris, 1859.
A Theoretical and Clinical Course of Internal Pathology and Medical Therapeutics. By E. Gintrac, Professor of Internal Clinic, Director of the School of Medicine of Bordeaux, Member of the Administrative Commission of the Civil Hospitals, etc. etc. Vols. IV. and V. 242

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XXIV. On the Signs and Diseases of Pregnancy. By Thomas Hawkes Tanner, M. D., F. L. S., Member of the Royal College of Physicians, etc. etc. 12mo. pp. 504. London, 1860. 256

XXV. Relatorio do Gabinete Estatistico Medico-Chirurgico do Hospital Geral da Santa Casa da Misericordia e Enfermarias publicas. Apresentado Ao Exmo. Sr. Marquez D'Abrantes, Provedor da Santa Casa, pelo Dr. Luiz Da Silva Brandao, Director do Gabinete Estatistico, etc. etc. Rio De Janeiro, 1860, 4to. pp. 62.
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Art. I.—*On Dislocations of the Shoulder-Joint, with a Description of a Novel and Efficient Method of Reduction.* By N. R. Smith, M. D., Professor of Surgery in the University of Maryland. (With a wood-cut.)

The anatomical mechanism of the shoulder-joint has remarkable peculiarities. Although classed with ball-and-socket articulations, it can scarcely be said to possess a socket at all, though having a very perfect head. So far as the bones are concerned, it is very imperfectly fortified, being remarkably contrasted in this respect with the hip-joint.

The shoulder-joint is also destitute of proper ligaments, that which is termed the capsular, or orbicular ligament, being little else than a loose synovial capsule, fortified with but few fibrous threads. The extreme mobility of this joint precludes the use of close ligaments, and also deep interlocking of the bones. Nature must therefore resort to adventitious mechanical aids to render secure this important joint.

The extreme mobility of the scapula would, at first thought, seem to be a circumstance of insecurity. It is, however, really quite the reverse, the ready yielding of the scapula defeating the effect of violence exerted on the joint through the humerus. The facile motions of the scapula, effected by its complicated muscular apparatus, enable it to present its shallow glenoid in almost every direction. When the arm is elevated, and sustains a force from above, the glenoid looks upward to oppose it. When we fall upon the hand, laterally, the same cavity presents downward and outward. It is thus capable of almost instantly opposing its surface to the head of the humerus, in whatever attitude it may present itself; thus revolving around it and really, in its mechanism, representing a much deeper cup than that which it exhibits in the skeleton.

Although this joint is destitute of a fibrous capsule, it possesses a substitute wonderfully adapted to its necessities. It has a most effective muscular capsule. Four powerful muscles arising from the scapula embrace the head, and are inserted into its base, the two bicipital tuberosities.

These muscles are far less concerned in the various motions of the joint than in keeping the head of the bone, in all its movements, closely applied to the glenoid cup. They perform, indeed, the office of a powerful contractile capsular ligament. If it were a fibrous resistant capsule, it would be either too loose to support the joint, or so close as to check its useful movements. These muscles are always in action when the extremity is being exercised.

The coracoid and acromial processes, with the coraco-acromial ligament, also adventitiously fortify the joint above, and in the direction in which the head of the bone is most frequently impelled. The tendon of the biceps, passing over the head of the bone, supports the joint in that direction in no small degree. Its continuity with the muscle gives it the character of an elastic and contractile ligament.

Notwithstanding these mechanical advantages peculiar to this joint, it is, owing to its great variety and extent of motion and the powerful leverage of the humerus, more frequently dislocated than any other articulation.

The various dislocations of the humerus illustrate more clearly than those of any other joint, the mechanism of the muscles in the production of luxation. This we should infer from the important part they perform in the offices of the joint.

The part which accidental violence performs in dislocating the shoulder is simply distortion. A person in falling, for instance, has the arm violently abducted—thrown upward against the side of the head. The thin capsule is strained and ruptured below; the muscular capsule, which embraces the head of the bone above, and which should resist dislocation, is relaxed; so also the deltoid. But there are three very powerful muscles which are violently put upon the stretch—the latissimus dorsi, the teres major, and the pectoralis major. By the action of these muscles the head of the bone is drawn violently into the axilla. The action of these muscles at the moment is abnormally violent, because, by the sudden force inflicted upon them, they are provoked to spasmodic action.

That such is the mechanism of this displacement is manifest from the fact that it is often effected by muscular action alone. It is not an uncommon occurrence for the humerus to be dislocated in a paroxysm of epilepsy. Many years ago I knew a lady subject to this malady, who suffered dislocation of the shoulder in almost every paroxysm. In the practice of my father, the late Prof. of Surgery in Yale College, a case occurred in which, in a paroxysm of puerperal convulsions, both shoulders were simultaneously disolcated and remained displaced for a long period of time, owing to the nature of the lesion being unnoticed at the time of its occurrence. In these cases the deltoid violently effects the abduction of the arm, while the pectoral and latissimus, with equal and sudden force, jerk the head downward into the axilla. This is the result of the want of harmony in the action of the muscles in the abnormal state.

The parts which suffer lesion in displacement are those, of course, which resist dislocation. The most important of these are the four muscles inserted into the bicipital tuberosities. Their fibres are, some of them, very short, and suffer laceration in vainly resisting.

The dislocation of the humerus forward under the coracoid is generally consecutive in relation to the axillary displacement. The head is first forced into the axilla, and then, sometimes the pectoral muscle being more stretched than the latissimus by the humerus being driven backwards as well as outwards, is dragged forward under the coracoid. In other cases it is effected by the inflicting of a blow upon the elbow, transmitting the force in the direction of the length of the humerus, the head of the bone being presented forward at the moment of the distortion.

The backward displacement of the head of the humerus, on the dorsum of the scapula, under the spine of this bone, is rare. I have seen but three cases in an extensive surgical practice of forty years. Only one of these was recent. Such displacement is probably effected by the combined action of two forces. A person falls forward with violence, the elbow encounters the ground, which inflicts a forcible counter-stroke in the direction of the length of the humerus. The arm at the same moment is driven forward upon the breast, rendering tense the latissimus dorsi, the teres major, and the posterior border of the deltoid. Provoked to spasmodic action, they co-operate with the counter-stroke in forcing the head over the border of the glenoid, backward.

It is not my purpose in this article to discuss fully the diagnosis of injuries of the shoulder, but rather to describe a method in some respects peculiar to myself (as I believe) of effecting the reduction of the luxated humerus.

I will remark, however, that I have known dislocation of the scapular end of the clavicle to be mistaken for dislocation of the head of the humerus —also fracture of the neck of the scapula, and fracture of the neck of the humerus—to be taken for the same injury. I have even known dislocation to be mistaken for a fracture of the humerus at the insertion of the deltoid, owing to the remarkable angle which the deltoid makes with the shaft of the bone at that point, when the head is displaced deeply in the axilla.

The mechanism of the reduction of a dislocated bone is, in most respects, similar to that of the dislocation. As muscular force is concerned in the displacement, so is it in the reduction. Accidental violence has been known to reduce a joint dislocated by the same. In Sir Astley Cooper's work on *Fractures and Dislocations* is related a case in which the hip-joint, dislocated years before on the dorsum ilii, was reduced accidentally by violence received by a fall in a storm at sea.

The force employed generally requires to be the converse of that which effected the displacement. Thus, if violent abduction has luxated a member, the opposite movement, or adduction, should effect its replacement, aided by the action of a set of muscles the antagonists of those which were concerned in the displacement. Traction, or extension, is, however, a part of the mechanism of reduction, but not often, if ever, of dislocation. This is a consequence of the overlapping of the bones and shortening of the limb in dislocations. The limb must, in many cases, be elongated in the mechanism of reduction, but not generally so in dislocations.

By far the most common dislocation of the shoulder is that into the axilla. It is not my purpose to give the history of the art of reduction as practised by various surgeons, but merely to describe the method which I have for many years practised and found to be the most efficient.

Extension, counter-extension, and manipulation, constitute the mechanism of the operation of reduction. Counter-extension is the mere fixing, or rendering firm and immovable, the scapula. The head of the humerus alone requires to be relatively moved. The immobility of the scapula effected by counter-extension, is obviously of essential importance. All the movements of the head of the bone, effected in the effort to reduce the same, would merely drag or thrust the scapula loosely about, without changing the relative positions of the head and glenoid.

To effect the immobility of the scapula is the real difficulty in the reduction of this dislocation. In many of the methods practised, the bands employed for this purpose oppose the return of the head of the bone to its place. By some a slit is made in a broad band of stout muslin, the arm carried through it, and one margin of the slit brought into the axilla and the other against the acromion. The tails of the band are carried, one across the breast, the other across the back, horizontally, and are secured to the wall. The lower margin of the slit supports effectually the lower portion of the scapula, but the support of the upper, which is by far the most important, is not well effected. The margin of the band cannot be expected to remain opposed to the thin edge of the acromion. It will either glide over the top of it, or fall beneath it into the depression caused by the dislocation. In the former case it will not support the scapula above, but will allow it to be drawn outward and downward. In the latter case it will, by occupying the cavity to which the head of the bone is to be returned, hinder the reduction.

In effecting counter-extension, it is undoubtedly, in most instances, expedient to apply our resisting bands as directly as possible to the bone from which the other is dislocated. But the difficulty in this case is to effect it without defeating the object in the manner indicated above.

On noticing the mechanical relations of the scapulæ, with their apparatus of muscles, to each other, it occurred to me to make counter-extension from the opposite wrist, an expedient directly at variance with the commonly received principle, because as remotely as possible from the bone to be supported. There are exceptions to most rules, and I shall endeavour to establish this as one.

Let us observe the continuity of ligament, bone, and tendon by which the two scapulæ are bound together and made mechanically dependent upon each other. Anteriorly the two acromion processes are bound together by an unyielding chain of bone and ligament. The two clavicles, the sternum, and the interclavicular ligament chiefly constitute this bond of union. The fibrous-resistent ligaments in this chain are not capable of being stretched. If traction be made from opposite wrists, the two acromion processes, thus tied together, are not capable of being drawn asunder to the extent of half an inch.

Posteriorly the continuity of resisting parts is almost as perfect. The broad expansions of the scapulæ approach each other not remotely, and they are bound to each other by the interposition of the ligamentum nuchæ, and indirectly by muscles and tendons attached to the spine. Traction from the two extremities will not therefore separate the scapulæ to any considerable extent.

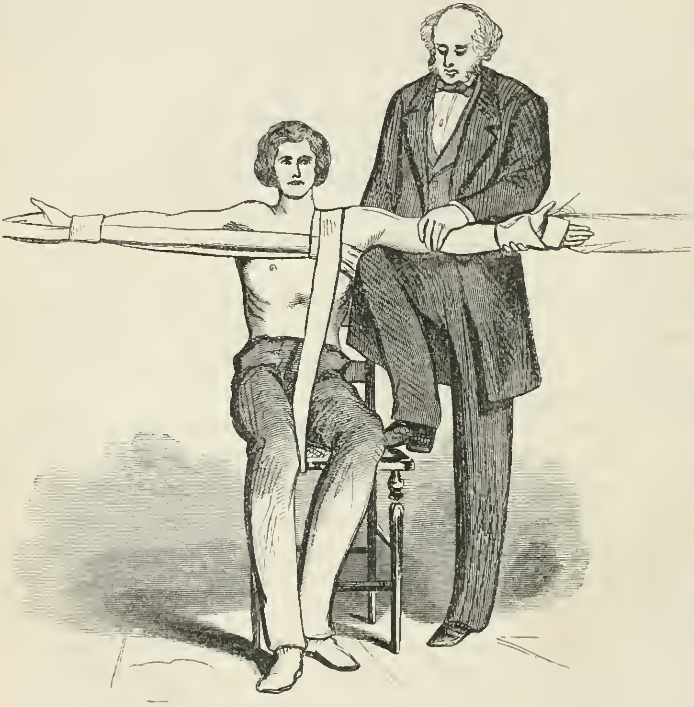
The superior angles of the scapulæ indirectly support each other through the medium of the cervical portion of the spine. The levator muscles, arising from the superior angles of the scapulæ, pass upward to be inserted into the transverse processes.

Now the object of counter-extension is to prevent the yielding of the scapula to the tractive force exerted upon the dislocated member. Nothing does this so effectually as the fixing of the opposite scapula by counter-extending from the wrist. Not only is the scapula thus sustained, but the spine erected and prevented from yielding to the tractive force, and becoming curved to the injured side, as invariably happens when counter-extension is chiefly made from the axilla as is usual. Let the experiment be made by allowing a person to incurvate the spine laterally, and then making traction horizontally from the two wrists. The spine will be immediately erected and the two scapulæ will at once assume symmetrical positions. And so in dislocation, the symmetry of the two sides tends at once to be restored. The head and spine are elevated, the two scapulæ firmly sustained, and effect is given, both to the tractive force, and to the necessary manipulation.

In some of the first cases in which I employed this method, I directed simply traction from the two wrists, and I am not now confident that this is not the best method. I placed the patient in a chair and directed two strong persons to make steady horizontal traction from the two wrists. As soon as the spasmodic resistance of the muscles was overcome, the head of the bone was disengaged, and the muscles which help us in such cases, suddenly lifted the head into its place. It will be observed that this method causes no appreciable pain, but rather relieves the suffering of the patient caused by the pressure of the head of the humerus.

It is now some twenty years since I commenced the use of this method, I am not, therefore, premature in expressing my confidence in it, and recommending it to the profession.

In cases in which, from unusual muscular development, or the age of the dislocation, much resistance is expected, I have modified the application of the counter-extension thus:—



I place the patient in a chair, sitting a little on one side of it, so as to allow room on the side of the injury for the operator's foot. I then pass a piece of stout muslin, folded, around the chest and under the axilla of the injured side. The tails of it I carry horizontally to the opposite side, one in front, the other behind, and extending the arm horizontally, bandage them firmly to the wrist of the sound side, leaving the ends projecting, to be well secured to the wall, or other unyielding substance.

I then pass an ordinary roller over the top of the injured shoulder, and back and forth, twice under the muslin band, to prevent its slipping down. Then I continue the same roller under the bottom of the chair and over the shoulder, three or four times. This helps to give steadiness to the scapula, and especially to prevent the involuntary rising of the patient from the chair, or the tilting of the scapula upward, when it is necessary to make the manipulation of which I am to speak.

I now attach the extending band to the wrist of the injured side. I am aware that this is counter to the practice of many very eminent surgeons, especially Sir A. Cooper. My reasons are these: First, the wrist furnishes, as we may say, a very convenient handle to the arm. The band employed, if properly attached, does not slip, nor lacerate the integuments. In cases in which no great resistance is expected, it can be conveniently grasped by the hands only of one or two persons. In the next place, this method gives much more mechanical advantage in the way of leverage, in executing the final manipulations by which the head of the bone is thrown into place. It also removes the bands and hands of the assistants further from the patient's chest, and gives the surgeon more free access to the shoulder and more command of the arm.

The principal argument in favour of attaching the extending bands above the elbow is the relaxing, by this method, of the biceps muscle, which, by the complete extension of the forearm, is rendered tense. This disadvantage in my opinion is more than counterbalanced by the advantages mentioned above. The biceps is not capable of insuperable resistance; besides, a certain tension of its tendon, where bound to the head and neck of the bone, is favourable to the reduction, and it is partly the action of this muscle that finally, with a sudden shock, restores the bone to its place. Besides, when the bands are applied above the elbow, the forearm being at right angles, from the form of the arm, if any considerable traction is made, they will invariably slip over the elbow, make very painful pressure on the sensitive parts in the bend of the elbow, and not only cause great suffering, but extend the forearm and thus defeat the object in view, so that the advantage sought is lost, and many disadvantages encountered.

I first apply a wet roller to the wrist, and then attach a muslin band by the clove hitch. Next I direct the extension to be made by two persons, at first outward and a little downward, gradually raising the arm to the horizontal direction, and finally a little above it. The extension must be made gently and steadily—gradually increasing the force, so as not to provoke the muscles to spasmodic resistance. As no pain is created by the force thus employed, it may be continued for a considerable time. The muscles, which at first resist, become fatigued and finally relaxed, and, in a large majority of instances of recent luxation, the head will slip into place without resort to any species of manipulation. I would even continue this traction, where much resistance is encountered, for a quarter of an hour before modifying the force; but, in case the object is not then effected, let the surgeon place his foot on the margin of the chair, and his knee in the axilla. Then let the assistants raise their line of traction above the horizontal as much as possible, and continue it for a moment. The surgeon should then direct that the arm be, by a sudden movement, carried downward while, by extending his foot, he elevates the knee in the axilla. He aids the assistants in this by grasping the arm near the elbow and using it as a lever. If the first effort is not successful, repeat it.

Sometimes I place, on the knee, a ball made by rolling up a bandage, but it is not important. The surgeon can thrust his knee into the axilla so as to avoid much pressure on the marginal muscles of the axilla.

I generally direct those who make the traction to sway the limb horizontally backward and forward, and, grasping it with my hands, at times rotate it a little on its axis, thereby contributing to the disengagement of the head of the bone.

Where the consecutive displacement under the coracoid has occurred, the procedure is nearly the same, except that I make the traction a little more in the direction backward and upward, so as to disengage the head from under the process.

The dislocation upon the dorsum scapulæ, as I have before remarked, I have never seen but in three instances, and only one of those was a recent case justifying the attempt at reduction. It had been dislocated five days, and had resisted an attempt at reduction in the hands of others. The subject was a female, and I could obtain no very satisfactory account of the mechanical mode of the injury. It was easily recognized, there being a tumour beneath the spine of the scapula, as Sir A. Cooper describes, of the size of the hemisphere of a small orange, the limb being shortened and thrown forward. A depression existed under the anterior margin of the acromion. I failed to effect the reduction in the method usually recommended, and which I had deemed the best. I did not then practise extension from the opposite wrist. I made it by carrying the arm through a slit in a sheet. The extension was effected from the wrist, and when continued for some time, I sought to throw the head into place by manipulation—that is, I placed my knee against the back of the neck of the bone, and, swinging the arm backward, endeavoured to prize the head into its place. I repeated the effort several times, but with no satisfactory result.

I then carried a band over the front of the shoulder, one tail under the axilla, the other above it. These I united, carried them backward and inward obliquely, and secured them to the wall. Then I made traction strongly from the wrist almost directly forward. Without much difficulty I thus drew the head of the bone forward over the margin of the glenoid, and had the satisfaction to see it slip into its place.

Much has been said of late of the sufficiency of *manipulation*, to the exclusion of extension, in the treatment of dislocations. By employing new terms, and ignoring the precepts of old surgeons, claims to originality have been set up. Although the term is modern, the method of manipulation has been practised for centuries. It is, in my opinion, ridiculous to throw away the advantages derived from extension for the sake of magnifying the importance of a particular method of manipulation. Mothe, a long time ago, reduced the dislocation of the shoulder into the axilla by placing the patient in a supine position, and carrying the arm outward and finally upward, parallel with the head and neck, making traction at the same time.

It is well known that a recent dislocation into the axilla, may sometimes be reduced by placing the knee in the axilla, one hand being placed on the shoulder, and the other using the humerus as a lever.

The supine position of the patient on a table is a very convenient arrangement in all dislocations of the shoulder, and is well calculated to promote the efficiency of the method which I recommend. I am not sure that it is not the very best, especially when chloroform is employed.

It will be observed, then, that I advise the combination of traction and manipulation. It would be as absurd to reject traction in all cases of dislocation, as it would be to attempt the reduction, by manipulation alone, of the fractured femur, where overlapping and shortening had occurred.

I will, at a future time, furnish for this Journal several cases illustrative of the method I have adopted. I will here state, however, that I have, by this mode, repeatedly reduced the dislocation of the shoulder which was two months old, and once when three months had elapsed. My class in the University of Maryland, in February last, witnessed the reduction of a dislocation on a muscular man some ten days after the injury. Repeated attempts had been unsuccessfully made, and the integuments had been much chafed. The extension and counter-extension were continued in the mode which I have described, for about five minutes, and then, by a slight effort, the knee being in the axilla, the head was thrown into its place. Scarcely any pain was inflicted.

In cases in which I expect great resistance I commonly employ chloroform. Whatever may be the propriety of using this agent for purely anæsthetic purposes in minor surgery, there can be no question of the propriety of resorting to it in difficult dislocations, inasmuch as we have two objects in view, the one immunity from pain, the other, relaxation of the muscles. The effect of the agent, however, must be rendered very complete, for the incomplete use of it causes spastic rigidity of the muscles and defeats the object.

I was not long since called to a case in a very muscular man by a friend, who had attempted the reduction unsuccessfully, having given chloroform. He had used it cautiously and not with full effect. I then gave it freely, till relaxation was complete, and accomplished the reduction with perfect ease.

Art. II.—*Statistical Inquiry as to the Expediency of Excision of the Head of the Femur.* By Charles K. Winne, M. D., of Buffalo, N. Y.

Resection of some of the larger joints dates from the most ancient times, having been proposed by Hippocrates[1] and advised by Celsus in compound luxations and fractures when reduction could not be effected, and also advocated in certain diseases of the bones by Paulus Ægineta[2] and Rhases; but the two latter writers, who alone mention the hip-joint, denounce all operative interference with it as involving too much danger to life.

The inception of excision of the head of the femur dates from a late period. The credit of suggesting it as an operation worthy of consideration has been awarded to Mr. Charles White,[3] of Manchester, who proposed it, as follows: "I have likewise, in a dead subject, made an incision on the external side of the hip-joint, and continued it down below the great trochanter, when cutting through the bursal ligaments, and bringing the knee inwards, the upper head of the os femoris hath been forced out of its socket and easily sawn off; and I have no doubt but that this operation might be performed upon a living subject with every prospect of success." This is the first mention of an operation rendered formidable by the character of the disease or injury for which excision is deemed necessary, the magnitude of the parts implicated, and the results which often succeed its performance.

In 1818 an appropriate case having presented itself to Mr. Anthony White,[4] the first operation of the kind was done with the most gratifying result. It was subsequently performed in two other instances by Sir B. Brodie and Mr. Hewson, but these terminating unsuccessfully, the operation was regarded with disfavour by the profession until 1845, when it was revived by Mr. Fergusson.[5] Since then it has been done in gunshot wounds and the latter stages of morbus coxarius, and by the labours of Fergusson, Jones, Stanley, and others, has assumed the status it deserved.

As the expediency of an operation of such intrinsic importance can only be satisfactorily ascertained by having recourse to statistics, I have endeavoured by the analytical collation of cases to deduce some data for the further elucidation of so interesting a question, and as cases for which the operation is applicable naturally separate into those dependent upon traumatic lesions, and those justified by the sequences of disease, I will pass in rapid and brief review the two classes of cases for which it is considered requisite.

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[1] Hippocrates "On the Articulations," sec. 68, and note.

[2] Paulus Ægineta, book vi., sec. 77, and note, sec. 84.

[3] White's Cases in Surgery.

[4] Cooper's Surgical Dictionary, article "Bones."

[5] Medico-Chirurgical Trans., vol. xxviii., or Medico-Chirurgical Review, April, 1846.

In military surgery the most eminent authorities from the time of Heister onwards, have coincided in the statement that the hazardous nature of wounds of the joints and the deplorable mortality arising from attempts to save them, have necessitated amputation in all severe cases of gunshot wounds communicating with them. This is more especially the case in gunshot wounds of the hip-joint, for Mr. Alcock's[1] experience in this form of injury was that "the result is generally fatal; three in four died; and in the fourth, when recovery took place, the joint itself, there is some reason to suspect, was but remotely affected." Dr. Thomson[2] also recommended immediate amputation at the hip-joint when "a musket-ball or grapeshot, or a small portion of shell has been observed to fracture the neck of the thigh-bone or to fracture the head of that bone, and pass through or lodge in the hip-joint. The proportion of cures which has been obtained from amputation at the hip-joint is, I believe, much greater than of cures from gunshot fractures of the head or neck of the thigh-bone. Indeed, of recoveries from these injuries I know of none which have been recorded. Those who for a time seem to do well, in the end sink under the hectic which supervenes." This is the opinion of all military surgeons, and Stromeyer, one of our recent authorities, says: "Left to themselves, all injuries of the femur close to the hip-joint must end fatally."

But the opinions of surgeons have gradually undergone modification since excision of other joints has been attended by success, both as regards a diminished ratio of mortality and a more or less complete use of the limb; and excision is now considered more applicable and as affording a better chance of success than amputation at the hip-joint, in those cases in which the fracture of the head and neck of the femur is unaccompanied by great laceration of the soft parts, injuries of the vessels, or extension of the fracture below the trochanter major; the presence of these lesions of course contraindicating it and affording no resort save disarticulation.

In confirmation of these views Mr. Guthrie[3] says: "Picture to yourselves a man lying with a small hole, either before or behind, in the thigh; no bleeding, no pain; nothing but an inability to move the limb, to stand upon it, and think that he must inevitably die in a few weeks, worn out by the continued pain and suffering attendant on the repeated formation of matter burrowing in every direction, unless his thigh be amputated at the hip-joint, or he be relieved by the operation which, I insist upon it, ought first to be performed."

Sir George Ballingall[4] remarks that the "experience which we have of excision of the head of the femur, in cases of caries, is now considerable, and appears to me to be encouraging; and since I have become familiar with the excision of other joints, I have frequently reflected upon the possibility of substituting the operation of excision for that of amputation at the hip-joint, in some of those cases of gunshot wounds where the latter has been recommended."

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[1] Medico-Chirurgical Trans., vol. xxiii., or Medico-Chirurg. Review, April, 1841.

[2] Quoted in Sir G. Ballingall's Outlines of Military Surgery, p. 441.

[3] Commentaries on Surgery, p. 77.

[4] Outlines of Military Surgery, p. 397.

The most complete and valuable data heretofore obtained were acquired by the English during their campaign in the Crimea. Mr. Macleod,[1] in narrating the uniformly fatal termination at an early period of the cases in which amputation at the hip-joint was done, declares that "all those, on the other hand, on whom excision was practised, lived in comparative comfort, all without pain for a considerable time. Out of the six operated on one survived for more than a month, one died from causes unconnected with the operation, and one case recovered entirely. The chance of saving life is thus manifestly on the side of excision, and this is truly the most important aspect of the question."

An operation which has thus met with the approval of those best qualified to judge will probably eventually supersede amputation at the hip-joint, as its results are more favourable in those cases of injury of the head and cervix of the femur unattended by the complications before mentioned.

The cases in which this operation has been performed for gunshot wounds are as follows:—

CASE I. Seutin removed six inches of the femur, including the head and cervix, in a comminuted fracture of the cervix attended with but little laceration of the soft parts, followed by death on the ninth day from gangrene.[2]

CASE II. Oppenheim removed the femur close to the trochanter minor in a fracture of the head of the cervix and trochanter major, from a musket ball. Death took place on the eighteenth day.[3]

CASE III. Schwartz performed a secondary operation, removing the former "two inches below trochanter minor." Death on seventh day from pyæmia.[4]

CASE IV. Ross operated two years after injury, followed by death.[5]

CASE V. Macleod, in a case of fracture of the trochanter major and cervix received from a ball which had also fractured the ulna, removed the necrosed bone and the head of the femur eighteen days after injury. From the rapid improvement of the condition of the patient and the healthy appearance of the wound, a portion of which had healed, hopes were entertained of his recovery; but about a week after choleraic symptoms supervened with a fatal result. Crude tubercles were found on examination, and the intestines presented appearances of diseased action. The limb was shortened two inches, and the divided surface was unchanged. No symptoms of pyæmia were discovered.[6]

CASE VI. Blenkins operated primarily in a case of injury from shell, which produced extensive laceration of the soft parts, and a comminuted fracture of the neck and trochanters. The femur was divided "at the junction of the upper fifth with the rest of the shaft," and the injury of the capsular ligament necessitated removal of the head of the femur also. The end of the femur and acetabulum were granulating well, and the condition of the patient was favourable, but pyæmia occurred at the end of the third week, causing death at the expiration of a fortnight.[1]

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[1] Notes on the Surgery of the Crimean War, p. 346.

[2] Chelius; System of Surgery.

[3] Ibid.

[4] Macleod; Surgery of Crimean War.

[5] Surgery of Crimean War.

[6] Ibid.

CASE VII. Crerar, a few hours after a comminuted fracture through the trochanter major had been made by a fragment of shell, the external wound being small, divided the femur below the seat of injury, removed fragments and then excised the head of the bone. The patient died of exhaustion on the fifteenth day after receipt of injury. "Cut surfaces of the femur perfectly smooth; bone easily divested of its periosteum; acetabulum smooth; muscles infiltrated with pus; nature had not made the slightest attempt to repair the loss."[2]

CASE VIII. O'Leary excised the head of the femur in a case of fracture of the trochanter major that appeared to involve the joint, which was incorrect, however, the head of the bone being uninjured; five inches of bone were removed; the man recovered, and the report several months after was that "the limb is two inches shorter than the corresponding one, and also considerably smaller; extension can be carried on partially, but he cannot flex the limb upon the thigh without placing his hand on the glutei muscles of the diseased side. Rotation, inwards and outwards, can be performed only to a limited extent. The wound over the joint is quite healed. The man's general health is good, but he cannot walk without the assistance of crutches.[3]

CASE IX. Hyde operated primarily for a comminuted fracture of the cervix. The patient died on the fifth day.[4]

CASE X. Combe operated, not primarily, however, for a fracture of the cervix, the head of the bone being sound. The man died at the expiration of a fortnight of exhaustion.[5]

Though but one case of excision recovered out of ten subjected to it, yet, on comparing the result of this operation with the alternative of amputation at the hip-joint, we find that out of 126 cases[6] on whom amputation at the hip-joint was done, 76 died; or, restricting our inquiries entirely to amputation at the hip-joint for gunshot wounds, out of 62 cases[7] operated on, but 5 recovered, being a mortality of 91.9 per cent.

I have found but one case recorded where the operation has been done as suggested by Jaeger, for abscess consecutive to fracture of the neck of the femur;[8] in this case the head and neck of the femur and two inches of the great trochanter were removed, by Textor, from a child of seven and a half years, followed by a fatal result on the twenty-third day. After death, the pelvis was found to have been fractured.

In estimating the value of the operation in morbus coxarius, we find that even now so little unanimity exists in the profession concerning it, that in but very few formal treatises on surgery is it recognized, or its claims advanced other than hesitatingly, in giving a hope of prolonged life, where, except in rare instances, anchylosis has formed, death has followed, either from the patient sinking exhausted, or from the disease extending to the interior of the pelvis through a perforated acetabulum.

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[1] Surgery of Crimean War.

[2] Guthrie's Commentaries on Surgery.

[3] Surgery of the Crimean War.

[4] Surgery of the Crimean War.

[5] Ibid.

[6] Erichsen's Science and Art of Surgery, 2d edition, p. 43.

[7] Notes on the Surgery of the Crimean War.

[8] Chelius' System of Surgery, vol. iii.

No parallel can be drawn between the result of excision in gunshot wounds and the termination of the same operation in disease, as in one an injury in an adult, of parts unaltered by long continuance of inflammatory action, compels its execution as the least of two evils, while in the other, a disease in the great majority of cases of constitutional origin, and one peculiarly an affection of childhood and early youth, demands, all other treatment having been ineffectual in arresting its progress, a resort to this extreme measure, hoping with the removal of the diseased portions which react upon the general health continuing and increasing the irritation, that a healthy inflammation will be substituted for an unhealthy one, the wound will cicatrize, and the patient be restored to health, or at least to a condition of comfort.

I am necessarily debarred from making any remarks upon the pathology of hip disease, as the object intended in this paper is more to describe the various results succeeding the operation, than to enter upon any elaborate statement in regard to the actual correctness of the views which instituted its practice. The cases most benefited by the operation, in the judgment of those most warmly in favour of it, are those which, in Mr. Erichsen's classification, constitute the femoral variety of the disease.

In these cases the head of the femur alone, or the cervix also, being carious; dislocation existing; the presence of sinuses through which necrosed bone is detected; abscesses exhausting by their continual formation and discharge; the intense suffering produced by the slightest motion; the health affected and manifested by hectic fever, night-sweats, and a depravation of all the secretions—all indicate the propriety of interference when the acetabulum is either healthy or but moderately affected, or when the condition of the patient is not so far reduced as to forbid the additional hazard of an operation.

I may incidentally mention that in the arthritic form, much may be done by the application of a properly adjusted apparatus, keeping the limb extended and motionless, toward promoting more or less complete anchylosis. Cases reported by Mr. Erichsen,[1] Mr. South,[2] and others, show that this mode of treatment is not confined to the earlier stages of the malady, but that it can sometimes be used with great advantage when dislocation upon the dorsum of the ilium has occurred before the formation of abscesses.

The following table comprises all the cases operated on for morbus coxarius which I have been able to collect:—

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[1] Medical News, June, 1857, or Lancet, March 28, 1857.

[2] Lancet, Feb. 1858.

Excision in Morbus Coxarius.

1	Velpeau's Surgery, edited by Mott, vol. ii.	Schmalz.	M.	..	Head of femur already separated by disease.	.. ..	Recovered.	Three years; false joint formed by trochanter major.
2	Cooper's Surgical Dictionary, "Bones."	White.	M.	14	Dislocation on dorsum ilii; acetabulum entirely absorbed.	Femur divided below trochanter minor.	Recovered.	Motion perfect save rotation of thigh outward.
3	Medico-Chirurgical Review, April, 1846.	Brodie.	..	Adult.	Head of femur in acetabulum.	.. ..	Died.	In a few days; effect of the operation.
4	Medico-Chirurg. Rev., April, 1846; Chelius' Surgery, vol. iii.	Hewson.	..	Adult.	Acetabulum diseased.	Femur divided above trochanter minor.	Died (3 months).	Acetabulum perforated; pelvic abscess.
5	Velpeau's Surgery, edited by Mott, vol. ii.	Schlichting.	F.	14	.. ..	Excision through enlarged opening of abscess.	Recovered.	Walking in six weeks.
6	Velpeau's Surgery, edited by Mott, vol. ii.	Vogel.	F.	..	Head of femur separated by disease; fistulæ.	.. ..	Recovered.	.. ..
7	Velpeau's Surgery, edited by Mott, vol. ii.	Kluge.	..	..	.. ..	Head of femur removed.	Died (2 dys.)	.. ..
8	Chelius' Surgery, vol. iii.; Lancet, vol. i., 1848.	Textor.	M.	54	Caries of great trochanter and cervix; acetabulum healthy.	Six inches of bone removed.	" (53 dys.)	Sloughs on sacrum; wound nearly healed; commencement of false joint; hectic fever.
9	Chelius' Surgery, vol. iii.	Texter.	M.	18	Caries of head of femur.	.. ..	" (4th day).	Gangrene.
10	Lancet, vol. i., 1848.	Textor.	..	..	.. ..	Removed all above trochanter minor.	Recovered.	.. ..
11	Braithwaite's Retrospect, 1846; System of Surgery, London, 1857.	Fergusson.	M.	14	Dislocated on dorsum ilii; acetabulum filled with fibro-gelatinous growth; fistulæ.	Longitudinal section; 4½ inches of bone removed.	Recovered.	Motion of limb as good as the other; though not as strong; nearly six inches shorter.
12	System of Surgery, by Fergusson, London, 1857.	Fergusson.	..	..	Sinus and abscess.	Margin of acetabulum removed; trochanter major left.	Improved.	Great relief; wound never entirely closed; died two years after of disease of liver; necrosed bone in cotyloid cavity.
13	Lancet, vol. i., 1848.	Roux.	M.	..	Dislocation; acetabulum much diseased; ramus pubes also affected.	Femur below the section infiltrated with pus.	Died (7th day).	Abscess in glutei muscles; secondary hemorrhage.
14	Lancet, vol. i., 1848.	Simon.	M.	Child.	Dislocated; sinuses; margin of acetabulum diseased.	Head of femur; portion of acetabulum removed.	Died (4th day).	.. ..
15	Lancet, vol. i., 1848.	French.	F.	10	Dislocated dorsum ilii; sinuses; acetabulum healthy.	Head and trochanter removed.	Recovered.	.. ..
16	System of Surgery, Fergusson, London, 1857.	French.	F.	..	.. ..	.. ..	Recovered.	.. ..
17	Lancet, April 7, 1849.	Fergusson.	F.	10	Dislocated on dorsum ilii; acetabulum filled up with healthy growth of bone.	Femur divided below trochanter major.	Recovered.	Motion very good; support weight in a short time.
18	Braithwaite's Retrospect, No. 19, 1849.	Smith.	M.	33	Centre and portion of margin of acetabulum removed; dislocated.	Femur removed below trochanter major.	Improved.	Died in a few months of Bright's disease and lumbar abscess.
19	Lancet, vol. i., 1848.	Walton.	M.	16	Dislocated; sinus; acetabulum not much diseased.	Femur divided below trochanter major; centre and margin of acetabulum removed.	Convalesc'g.	At date of report wound nearly closed; great general improvement.

Excision in Morbus Coxarius—Continued.

20	Braithwaite's Retrospect, No 22.	Skey.	F.	13	Dislocated on dorsum ilii; acetabulum enlarged upwards and backwards; head of femur absorbed.	Removed below trochanter major.	.. ..	Result not stated.
21	Braithwaite's Retrospect, No. 29.	Stanley.	M.	8	Dislocated; abscess and fistulæ.	Head of femur removed.	Recovered.	Health improved; part of wound discharging for over a year; some motion.
22	Braithwaite's Retrospect, No 29; Medical News, Dec. 1854.	Erichsen.	M.	14	Dislocated on dorsum ilii; abscess; acetabulum filled with "plastic matter" save at one point, which was carious.	Head of femur removed; spot in acetabulum gouged.	Died.	Improved at first; suppuration profuse.
23	Lancet, vol. i., 1851.	Morris.	M.	..	Dislocated.	.. ..	Recovered.	Motion perfect, 3½ inches shortening.
24	Buffalo Medical Journal, Feb. 1855, paper by Dr. Sayre.	Sayre.	..	..	.. ..	Head of femur removed.	.. ..	Progress unfavourable; abscess.
25	Buffalo Medical Journal, Feb. 1855, paper by Dr. Sayre.	Hawkins.	F.	10	Margin of acetabulum diseased.	Divided below trochanter; edge of acetabulum removed.	Died (3d day).	Acetabulum perforated.
26	Buffalo Medical Journal, Feb. 1855, paper by Dr. Sayre.	Bigelow.	M.	10	Dislocated.	.. ..	Died (12th day).	.. ..
27	Buffalo Medical Journal, Feb. 1855, paper by Dr. Sayre.	Sayre.	F.	9	Large abscess; dislocated on dorsum ilii, surrounded by new bone; upper margin of acetabulum absorbed.	Removed through cervix margin, acetabulum, anterior spinous process, and crest ilium gouged.	Recovered.	Very slight shortening; motion very good.
28	Braithwaite's Retrospect, No. 23.	Cotton.	F.	..	.. ..	.. ..	Died.	Several months after; death not influenced by operation.
29	Medical News, August, 1854, *et sequiter*.	Fergusson.	F.	12	Dislocation.	Head and both trochanters removed	Convalesc'g.	Doing well several months after.
30	Medical News, Oct., Dec. 1854.	Erichsen.	M.	8	Hectic; acetabulum also diseased.	Head and cervix removed; acetabulum gouged.	Recovered.	.. ..
31	Medical News, Oct. 1856.	Shaw.	M.	18	Dislocated on dorsum ilii; cartilage absorbed from cotyloid cavity; no active disease.	Head and neck removed.	Improved.	Discharge continued.
32	Med. Times and Gazette, Feb. 7 and April 4, 1857.	Hancock.	M.	14	Acetabulum perforated; pelvic abscess.	Head and trochanter major, floor of acetabulum removed; abscess opened.	Recovered.	Walking in six weeks.
33	Med. Times and Gazette, Feb. 7, 1857.	De Morgan.	M.	17	Dislocated; acetabulum almost healthy.	Head and neck removed.	Recovered.	.. ..
34	Med. Times and Gazette, Mar. 28, 1857.	Jones.	F.	26	Hectic; bedsores.	Head of femur in socket; cotyloid cavity perforated; large abscess; sinus along ilium.	Recovered.	Three inches shortening.
35	Med. Times and Gazette, June 13, 1857.	Stanley.	M.	14	.. ..	Head of femur removed with pliers.	Convalesc'g.	.. ..
36	Med. Times and Gazette, June 13 and Oct. 24, 1857.	Bowman.	M.	11	Abscess; sinus; head in cotyloid cavity.	Femur divided at trochanter minor; acetabulum gouged.	Recovered.	.. ..

Excision in Morbus Coxarius—Continued.

37	Med. Times and Gazette, Oct. 17; Med. News, Sept. 1857.	Holt.	M.	7	Sinuses; false anchylosis.	Head and neck with portion of acetabulum removed.	.. ..	.. ..
38	Med. News, June; Med. Times and Gazette, Oct. 24, 1857.	Erichsen.	M.	7	Hectic; dislocated; fistulæ.	Removed through trochanters, also margin of acetabulum.	Improved.	Carious bone removed several months after; great discharge.
39	Med. News, Sept.; Med. Times and Gazette, Oct. 24, 1857.	Bowman.	F.	5	Head of femur partially absorbed; acetabulum diseased; ramus pubes bare.	Acetabulum gouged.	Recovered.	.. ..
40	Medical News, Nov. 1858.	Fergusson.	M.	Child.	Head of femur partially absorbed; acetabulum filled up.	Wound united by silver sutures.	Convalesc'g.	.. ..
41	Lancet, Feb. 1858.	Price.	M.	8	Appearance of dislocation; bone inclosed in capsular ligament.	Acetabulum healthy save one or two points.	Recovered.	Walking on crutches in nine weeks.
42	Lancet, Feb. 1858.	Hancock.	M.	10	Dislocated; sinuses; phthisis.	Femur divided below trochanter; upper margin of acetabulum diseased.	Improved.	Died ten weeks after of phthisis.
43	Lancet, Feb. 1858.	Simon.	M.	Child.	Advanced phthisis; sinus and abscess.	Head of femur removed through enlarged abscess.	Died.	Fatal result not hastened by the operation.
44	Lancet, Feb. 1858.	Stanley.	M.	13	Dislocated on pubes; cotyloid cavity filled with soft substance.	Head of femur removed with the saw.	Died.	Phthisis; discharge profuse.
45	Lancet, Feb. 1858.	Coote.	M.	16	Dislocated on sciatic notch; acetabulum probably filled up.	Head of femur removed.	Convalesc'g	Doing well in every respect several weeks after.
46	Lancet, Feb. 1858.	Ure.	M.	8	Dislocated on dorsum ilii; sinuses; abscess; acetabulum softened.	Femur divided through cervix; acetabulum gouged.	Recovered.	Shortening not greater than before; heel raised; six weeks after could flex and abduct thigh.
47	Wagner on Resections.	.. ..	M.	..	Abscess; head and neck separated by disease.	Removed through incision.	Improved.	Died of Bright's disease one year after; motion limited.
48	Wagner on Resections; Medico-Chirurgical Review, Oct. 1857.	Heyfelder.	M.	20	Partial dislocation; acetabulum also diseased.	Head of cervix, part of trochanters, and acetabulum removed; actual cautery.	Unsuccessful.	Amputation at hip-joint three years after; death in 2 hours; pelvis diseased.
49	Wagner on Resections.	Buchanan.	M.	41	.. ..	Head, neck, and margin of acetabulum removed.	Died (3 months).	Dysentery; acetabulum filling up deposit cartilage on femur.

An abstract of the above table of 49 cases operated on for caries affords the following results:—

	20	cases recovered.
	5	" convalescing or doing well.
	6	" were improved.
	15	" died.
	3	" the result was not stated.
Total	49	

Though great relief was experienced from the operation, yet other diseases eventually caused a fatal termination in four of the cases noted as improved; one dying after a few weeks and the others lingering for some months, the wound in one never entirely closing owing to the presence of necrosed bone. Suppuration still continued in the two others when reported, and necrosed bone was removed from one several months after.

The time of death in those cases resulting unfavourably is noted in the reports of 16 cases. 5 cases terminated fatally on or before the seventh day; 1 in a few days; 1 before the expiration of a fortnight; 4 before or during the third month; 2 after an interval of several months; and 3 at an advanced period, ranging from one to three years.

The causes of death including in this enumeration the diseases which carried off those marked as improving, are stated in the records of 15 cases. Viewing death as arising both from the operation and its consequences, and as depending upon the complications of other diseases which might arise under any circumstances, and which cannot *per se* be regarded for that reason as exercising any adverse influence upon the operation in other cases, we find that death ensued,

As the direct effect of the operation in	1 case.
From long continued and profuse suppuration . .	2 cases.
Gangrene	1 case.
Secondary hemorrhage and exhaustion	1 "
	5 cases.

Diseases causing Death.

Enlargement of the liver	1 case.
Bright's disease of kidney and lumbar abscess	1 "
" " "	1 "
Phthisis	3 cases.
Dysentery	1 case.
Death not attributable to operation	1 "
Hectic fever; bedsores; wound nearly closed, false joint forming	1 "
	9 cases.
Amputation at hip-joint for recurrence of caries	1 case.
Total	15 cases.

The age and sex of the patient, as might *a priori* be expected, influence in a great measure the frequency and result of the operation. The following tabular forms comprise the most important points connected with this part of the subject, excluding the three cases of whom the only information respecting their age is that they were children, and classing the two adults in the last table.

No. 1.—10 years of age or younger.
13 cases, 8 males, 5 females.
8 recovered.
1 improved.
1 result not stated.
3 died.

No. 2.—Between 10 and 15 years.
10 cases, 7 males, 3 females.
5 recovered.
2 convalescing.
1 result not stated.
2 died.

No. 3.—Between 15 and 20 years.
6 cases, males.
1 recovered.
2 convalescing.
1 improved.
2 died.

No. 4.—Above the age of 20 years.
5 cases, 3 males, 1 female, 1 sex not given.
1 recovered.
1 improved.
3 died.

One of the most serious objections urged against the operation by its opponents, of whom Mr. Syme[1] is the most prominent and unsparing, is that the acetabulum being almost always affected, the extension of the disease to the pelvis renders futile all attempts to prolong life by the excision of the diseased portions of the femur. The condition of the acetabulum is noted in the preceding table in 32 cases.

Acetabulum healthy; 1 recovered, 1 died	2
Acetabulum absorbed, altered in form or filled with new growth of plastic matter; 3 recovered; 2 convalescing; 1 result not stated; 1 died .	7
Not sufficiently diseased to require interference; 2 recovered; 1 improved	3
Small part of margin or centre of acetabulum removed; 1 recovered; 1 convalescing; 4 improved; 3 died; 1 result not given . . .	10
Acetabulum extensively diseased; 4 recovered; 2 died	6
Perforation of acetabulum and pelvic abscesses; 2 recovered; 2 died .	4
Total cases	32

I have since found that the above table agrees substantially with the researches of Mr. Hancock upon this point; in those it is stated, that "in 19 of 27 operations performed, the acetabulum afforded more or less evidence of disease at the time of operation. In two there was scarcely a trace of acetabulum. In three the acetabulum was filled with a fibro-gelatinous mass. In six the gouge was employed for caries. In three it was perforated, and in the others it was more or less affected."[2]

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[1] Treatise on the Excision of Diseased Joints, p. 124; Edinburgh, 1831.

[2] British and Foreign Medico-Chirurgical Review, October, 1857, p. 307.

Owing to the limited number of cases which have been subjected to post-mortem examination, only an approximate idea can be formed concerning the ultimate changes taking place in the parts toward the formation of a false joint. Mr. Walton[1] speaks of a specimen in which the extremity of the femur was rounded off and connected by ligament with the acetabulum. In a specimen in the possession of Mr. Jones,[2] the end of the femur was connected with the ilium above the cotyloid cavity by an almost complete capsule of fibrous tissue; the acetabulum having been partially absorbed. In Wagner's work on Resections, the appearances of several cases are described. In one, two bony prominences formed from the remainder of the neck of the femur were connected, one above, and the other with the original acetabulum (Case 47), by fibrous tissue. In another who died before the reparative process was completed (Case 8), deposit of new bone had taken place on portions of the acetabulum, and on the femur, the extremity of which was rounded off, and a new irregularly shaped acetabulum was being formed on the ischium where the femur rested. In a third case (Case 2), the bones were united by fibrous tissue, a portion of which consisted of part of the original capsular ligament. Anchylosis had once been present in a case (No. 48) which terminated unsuccessfully, subsequent amputation having been necessary. In only one case (No. 49), where dysentery caused a fatal result in three months, is mention made of cartilage being formed upon the divided surface of the femur; in this case also the acetabulum was being filled up with granulations, save in one spot where a portion of necrosed bone was undergoing disintegration.

The only conclusions we can arrive at from such a paucity of cases, are, that in all probability the bone undergoes after excision the same changes which occur after amputation; that is, its medullary canal becomes occluded, its extremity rounded off and connected either near the acetabulum or with it by fibro-ligamentous tissue, forming the first variety of false joints, described by Rokitansky;[3] or very rarely, perhaps, as in the case before mentioned, by the deposition of cartilage and the formation of a more or less perfect capsular ligament.

In the preparation of this succinct account of the principal points of interest connected with the history and practice of excision of the head of the femur, I have omitted all mention of the various modes of operating, and the manner of dressing the limb subsequently, believing that from other sources more information relating to these matters can be acquired than can be advantageously compressed into the brief notice I can give them.

Several cases which I have seen incidentally mentioned by various writers, I have omitted; for the reason, that I cannot refer to any very authentic histories of them.

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[1] Lancet, June, 1850, p. 617.

[2] Medical Times and Gazette, Nov. 4, 1854, quoted in Braithwaite's Retrospect, Part 31.

[3] Pathological Anatomy, vol. iii.

I have also, as far as possible, avoided extended comments upon the different classes of cases, or from deducing conclusions from them other than those naturally flowing from them.

Art. III.—*Notes of Surgical Cases.* By B. A. Clements, M. D., Assistant Surgeon U. S. Army.

Case 1. *Bayonet wound through the abdomen; recovery.*—The generally fatal nature of penetrating wounds of the abdomen renders more interesting and worthy of note those exceptional cases, in which the abdominal cavity has been penetrated by large and even sharp instruments and the wounds have been followed by "inconceivably" rapid recoveries. Cases of this exceptional character, of which the following is a rare example, have been related by Paré, Wiseman and others.

Musician E., 7th Regiment Infantry, age 32 years, a healthy temperate man, of spare figure, received on 17th June, '58, at the crossing of the "Big Blue" River, Kansas, a wound from a bayonet in the hands of a deserter which entered at the free extremity of the last false rib on the left side two inches above the crest of the ilium and about four inches from the spine, and emerged at the opposite side of the body, at the edge of the cartilages of the false ribs, two and a half inches to the right of the median line.

The wound was inflicted early in the morning while the patient was fasting, and at the moment he was in a stooping posture, which threw the left side higher than the right; the bayonet was run up to the hilt, and the patient grasped its point as it emerged through the right side.

There was very little hemorrhage from either wound; he walked a few steps, but then fainted. The wound was simply dressed with cold water, and he was left at a cabin near the roadside with a careful attendant. During the day he rejected all fluids taken into the stomach, and in the evening had great pain over the whole abdomen, and was unable to extend the left thigh and leg: he was taken with hiccough, which soon gave place to a severe convulsive movement attended with twitching of the face, and coldness of the body, but without insensibility; these attacks were each of some minutes' duration and recurred five times during the night.

The following day he had fever, high-coloured urine and frequent micturition, and his abdomen was painful, swollen, and hard. On the 19th, two days after the receipt of the wound, he suffered so much from these symptoms that the attendant gave him "a dose of calomel and rhubarb," and, the pain increasing towards evening, he cupped him over the abdomen and immediately after applied a blister; at night he had two free evacuations from his bowels, which gave him great and speedy relief from the pain, after which he obtained some sleep.

On the 21st I saw him for the first time with Assistant Surgeon Williams, when we received the foregoing account from the attendant, a very reliable intelligent man who had been left with him. The particulars as to the infliction of the wound were confirmed from other reliable sources, and from the patient himself.

The triangular shaped wounds of the bayonet were found in the positions already mentioned, that in the left loin being the largest, and both in process of healing; his countenance was good, pulse regular and of normal frequency, tongue clean, and but little thirst; there was no pain on pressure in the course of the wound, nor at any part of the abdomen, except a small spot in the left iliac region and upper inner side of the left thigh; the urine was rather high coloured, but presented to the eye no indication of blood, and particular inquiry elicited nothing to induce the belief that it had at any time been bloody; he passed it without difficulty, and was still unable to extend his left thigh. A quarter of a grain of morphia three times a day was directed, complete repose and the lowest diet.

22*d.* Pulse normal; slight pains still in the right iliac region, increased by attempts to extend the thigh; bowels moved naturally last night. Treatment continued.

26*th.* Ninth day. He has steadily improved to this date on the lowest diet, and without an untoward symptom, and, with the exception of some slight pain about the left groin when he extends the leg of that side, he is now well.

He soon after joined his regiment, and made the long and wearying march to Utah, and when I last saw him, more than a year afterwards, he continued quite well, suffering no other inconvenience from his wound than a dull pain in his left loin when he ran or jumped.

The great and speedy relief to the abdominal distress by the operation of a cathartic is convincing proof that though the abdomen was fairly transfixed the bowels were uninjured, even if the exceedingly rapid recovery did not place it beyond doubt.

The hiccough may be referred to penetration of the lower part of the diaphragm, and the pain in the left groin and thigh to injury of the psoas muscle and the lumbar plexus.

CASE 2. *Prolapsus ani with chronic inflammation of the rectum, cured by the local application of pure nitric acid.*—The local application of pure nitric acid for the cure of certain forms of hæmorrhoids was some years since recommended by the late Dr. Houston, of Dublin, but attention was first called to its use in prolapsus ani by Mr. Henry Smith, Surgeon to the Westminster Dispensary, London, in the *Medical Times and Gazette* for January, '58, who there speaks in high terms of its efficacy in the complaint and who has more recently published a work on the subject in which this favourable opinion is amply sustained by his subsequent experience.

Private L., 7th Regiment Infantry, a German of nervous temperament, aged 32 years, was admitted to hospital at Camp Floyd, Utah, November 26th, '58, complaining of "piles." In 1852 he contracted dysentery while on the expedition to Red River under Captain Marcy, and since that time had had repeated attacks, attended, he says, with "piles." The surgeon of the post at which he was stationed at the expiration of his first enlistment, refused to re-enlist him in consequence of this disease, but he again enlisted elsewhere, though he had never been free from his complaint. In May, '58, at Fort Leavenworth he had another severe attack of dysentery, from which he had suffered more or less up to the time of his admission.

He was treated by the usual internal remedies and astringent applications up to February, 1859, without material benefit. An examination at this time revealed a marked degree of prolapse of the rectum, the protruded mass being about 2½ inches in diameter, of a vivid red colour, and its surface covered with a viscid layer of yellow unhealthy looking mucus: his bowels were moved from four to six times a day, the evacuations being small and always attended with much pain, straining and prolapse of the parts, which last he had, however, learned to reduce without much difficulty. He was pale and cachectic in appearance, had poor appetite, and was exceedingly nervous and low-spirited.

On February 17th I applied pure nitric acid to the prolapsed parts. Having previously administered a small dose of castor oil, the parts were freely exposed by straining, and having cleansed the surface of the thick tenacious dark-yellow mucus which covered it, the pure acid was freely applied over the whole surface without touching the skin.

The application was unattended by any pain or uneasiness except a slight stinging sensation, but was immediately followed by an ash-coloured eschar. The parts being then bathed with cold water for some minutes were returned, and the recumbent posture with low diet enjoined. Two grains of opium were given at night.

18*th.* There has been a slight discharge of blood, but he has no pain, and his bowels have not moved. Ordered one grain of opium three times a day; recumbent posture to be maintained.

On the 19th his condition was the same; on the 20th he had one evacuation from his bowels unattended with pain, and neither during nor after the evacuation did the bowel protrude, which had not been the case before for nine months.

21*st.* He had one evacuation without prolapse of bowel.

22*d.* The stool was tolerably firm and unattended with pain; but it was narrow and flattened in shape, and was followed by a discharge of about one drachm of blood.

24*th.* The stool to day was larger in size than on the 22d and was but slightly flattened.

On examination, no protrusion or eversion of the rectum could be perceived even on moderate straining. On introducing the finger there seemed to be a thickening of the mucous membrane, and some contraction of the calibre of the rectum for about two inches, but the parts were not dense or resisting to the touch; this condition was probably due to a temporary swelling of the mucous membrane.

On the 27th, by causing him to strain violently I obtained a glimpse of a very small portion of the mucous membrane, which was very red, but not ulcerated. He had now not the slightest eversion of the parts at stool, and he was free from the distressing tenesmus from which he formerly suffered so constantly. Opium, which of late had only been given at night, was withdrawn, his diet was increased, he improved very rapidly in general appearance, and was returned to duty on 6th of March, eighteen days after the operation.

The shape of the evacuation noted on the fifth day after the application of the acid was probably due in some degree to temporary swelling of the mucous membrane, but in greatest measure to irritability or spasm of the sphincter ani.

Five months afterwards I again examined this patient. I found he could produce some eversion of the mucous membrane by hard straining, but it was of perfectly healthy appearance, being of a pale pink colour, the rectum seemed to preserve its normal calibre, but he stated that his feces were somewhat flattened in shape, due I believe to irritability of the sphincter which had evidently great power. His bowels moved regularly, he was free from dysenteric discharges, and had improved very much in his general health. Occasionally he has had a slight eversion of the mucous membrane at stool, never, however, amounting to prolapse, or occasioning inconvenience, but he has always been able to draw it back simply by contracting the sphincter. Until this operation he had not been free from dysenteric discharges of bloody mucus and prolapse of the rectum for some years. He continued well up to November, 1859, when I last saw him, and up to that time had not lost a day's duty by sickness.

Case 3. *Communication of secondary syphilis; transmission of infection from a secondary sore.*—The following case, which came under the notice of several of the medical officers of the army in Utah, and which was for some time under my care, is a marked example of the production, by contact with a secondary syphilitic sore or its secretion, of an ulcer with all the characters of a chancre, which ulcer was followed by constitutional syphilis.

Mrs. E., a Mormon woman aged 17 years, was married on 16th December, 1858, to a discharged non-commissioned officer of dragoons; though not robust she had always enjoyed excellent health up to the time of her marriage.

She believed that she became pregnant within a month or six weeks after her marriage.

The medical history of her husband was as follows: He contracted a chancre on the penis at Fort Leavenworth in July, 1857, and having immediately after to make a rapid trip across the plains, he was subjected to much exposure, and in consequence could not receive the necessary attention or treatment for his disease. The chancre, however, was healed during the winter of that year, but was followed by sore throat and sores on the tongue and inner side of the lips.

As he himself had not been under my care, I did not examine him; but Assist. Surgeon Norris, whose patient he had been, had carefully and often examined him, and kindly informed me that the sores on his tongue and in his mouth were undoubtedly syphilitic "mucous papules" or "flat tubercles;" and these sores existed at the time of his marriage to the subject of this case and for several months subsequent.

In February, 1859, two months after Mrs. E.'s marriage, her husband in caressing her bit her slightly on her upper lip, and she having been much exposed to cold on a short journey, this slight wound inflamed, a sore appeared, which swelled very much, increased rapidly to the size of a dime, became rounded in shape, of a dark red colour with hardened elevated edges and a shining base, and discharged a dirty looking secretion. The peculiar character of the sore inducing suspicion, Assist. Surgeon Norris, under whose care she then was, invited Assist. Surgeons Williams, Getty, and myself to see her in consultation, when the sore was found in the condition just mentioned, and we all coincided in opinion that it was a chancre.

The local remedies applied to the sore not having produced much benefit, she was put upon a course of mercurials, under the use of which the sore slowly healed by the end of March. But at this time her throat became sore, and an elevated papular port-wine-coloured eruption appeared over her whole body and especially upon her face. It was from these symptoms she was suffering when she came under my care in May. I found her throat much swollen, of a dark red colour, with dirty yellow patches on the tonsils and fauces, which were covered with a copious secretion of offensive brownish mucus. The appearance of the eruption and of her throat was unmistakably syphilitic. She was pale and cachectic in appearance, and there were also some very superficial simple excoriations on her vulva, which had then existed only some two weeks, and were plainly due to want of cleanliness; these were speedily healed by the application of lead-water and the observance of cleanliness.

She was treated with iodide of potassium, bitter tonics, and the application of a strong solution of nitrate of silver to the throat, and by the end of July, these symptoms had almost entirely disappeared, and she had recovered in great measure from the pallor and debility under which she had laboured.

On the 15th August, eight months after her marriage, being then apparently free from secondary symptoms, she was prematurely delivered of an imperfectly developed dead child, which was soft and semi-putrid.

She did not seek advice again up to March, 1860, when I last saw her.

The particulars of this case were ascertained by repeated examinations and careful inquiry, and scarcely require comment. Yet it may be remarked that there can be no question as to the character of the sore on the patient's lip, nor doubt as to its mode of production. With this efficient cause for the secondary symptoms existing, I cannot refer them to infection through the fœtus in utero begotten by the diseased father; and an attentive consideration of the case will, I believe, render the conclusion unavoidable, that a chancre on the lip which caused marked constitutional syphilis was produced by the secretions from secondary syphilitic sores in the mouth of the patient's husband, acting on an abraded surface.

On the debated subject of the transmissibility of infection from secondary sores, Mr. Harrison in a recent work on syphilis, says :—

"The effect of the contagion of syphilis, when contracted by transmission from secondary sores, is, according to M. Bonnet, of Lyons, an ulcer which becomes developed after a variable period of incubation, which presents all the characters of the true primary syphilitic chancre, and is, like it, followed by other secondary symptoms."—*London Lancet*, July, 1860.

The question "Are the secondary symptoms of syphilis contagious?" was propounded to the Academy of Medicine of Paris, by the Minister of Public Works, in 1859, and a committee consisting of Velpeau, Ricord, and others, after instituting experiments, replied as follows: "There are secondary or constitutional symptoms of syphilis which are contagious. The principal of these is the mucous papule or flat tubercle."—*London Lancet*, August, 1859.

Case 4. *Wutzer's operation for the radical cure of hernia; unsuccessful.*—The following case is illustrative of two of the causes which may prevent the success of Wutzer's operation for the radical cure of hernia, an operation which would appear to be attended often with favourable results.

Private M., 7th Regt. Infantry, a German, aged 24 years, stout and healthy. A prisoner for desertion, he was made to quarry stone, and contracted an oblique inguinal hernia on the left side, which he first observed about 25th April, '59. On an examination made June 1st, '59, the hernia was found to be voluminous, filling the scrotum; the inguinal canal was deep and so very short as at first to cause the hernia to seem "direct;" the external ring was smaller than the internal, and the scrotum and walls of the canal tough and resisting.

A truss was applied for four weeks without benefit, and I determined to perform Wutzer's operation in the manner recommended by W. Spencer Wells. The case, however, was considered not a favourable one owing to the condition of the parts already mentioned.

The operation was done on the 28th June, in the usual manner. The patient was kept in the recumbent posture, and the instrument well supported. His bowels had been freely moved previously, and he was put upon low diet. In the afternoon, in consequence of some pain in the parts, the plate was slightly loosened and Tr. opii gtt. xxx given.

The following day he complained that the instrument hurt him, and as the plate did not press quite evenly near the point it was loosened and readjusted. He also complained of pain running up from the inner ring to the umbilicus.

The second day all pain had ceased.

The third day he had some pain, in the scrotum which I referred to the cord; there was a bluish discoloration at the point of exit of the needle, and he could bear the pressure of the instrument better.

On the fourth day there was some fibrinous incrustation at the base of the projecting part of the needle.

The fifth day there was a slight excoriation of the skin at the lower edge of the point of the plate, and evidence of slight suppuration at the point of exit of the needle.

On the seventh day the suppuration at the point of emergence of the needle through the skin of the groin was decided, and a serous exudation covered the plug and exuded from the cavity.

On July 6th, the eighth day after the operation, the plug of the instrument was coated with a glutinous discharge, and the instrument was removed. The surface of the plug of skin was excoriated, and the cuticle around the puncture of exit of the needle was elevated for a space the size of a dime, and the skin was also abraded where the lower edge of the point of the plate had pressed. The plug of skin bore considerable traction, during which the parts up to the inner ring plainly moved together, showing that some adhesion had taken place.

The cul-de-sac was filled with oiled charpie, and the scrotum well supported without the application of a bandage.

The day after the removal of the instrument the plug seemed to have come down a little, and with each succeeding day the cul-de-sac became still more shallow until on the night of July 16th. Eighteen days after the operation the intestine again came down into the scrotum whilst he was lying in bed. Two days afterwards the cul-de-sac was entirely obliterated, and the hernia was in the same condition as before the operation. Both the punctures made by the needle had entirely healed.

Some union of the opposed surfaces had evidently taken place; the instrument may perhaps have been removed too soon, yet the failure of the operation must be ascribed in greatest measure to the causes which before its performance were considered as unfavourable to its success, the shortness and depth of the inguinal canal, and the dense and powerful scrotum whose contraction doubtless loosened the soft adhesions.

The instrument used was incapable of being adapted to varieties in the shape and size of the rings and canal, and an operation which I saw performed with it after the above, though the case seemed a most favourable one, was unsuccessful; the hernia coming down in five or six weeks. The many modifications of the plug of the instrument more recently introduced will doubtless lessen the cases of failure of the operation, which it would appear are not unfrequent.

CASE 5.' *Lateral dislocation of the head of the radius converted into the dislocation forwards and backwards.*—Lieutenant L., U. S. A., was thrown from a vicious mule on October 1st, '59, and received the weight of his body on his left hand extended before him.

On visiting him half an hour after the accident, I found the elbow-joint very much swollen and so painful as to render a minute examination impracticable. A prominence, however, could readily be felt on the anterior surface of the external condyle of the humerus; the forearm was in a position about half way between pronation and supination, inclined rather more to the latter, and incapable of being either fully flexed or extended; nor could this position be changed without causing extreme pain. He stated that he had a sensation of numbness in the *thumb.*

Having in the course of an hour obtained the assistance of Surgeon Porter, he was put under the influence of chloroform, the parts having by this time become much more painful and greatly swollen. On making rather sudden flexion of the forearm upon the arm, a marked crepitus was for a moment distinguished, but no manipulation could again elicit it; and at the same time it was observed that the projection over the outer condyle had disappeared, and the head of the bone was distinctly felt at the middle of the joint over the lower extremity of the humerus, and the motions of flexion and extension became still further impaired. Being now fully under the influence of chloroform, extension was made from the wrist, and the thumb at the same time pressed upon the head of the bone, when it returned to its place with an audible snap, only a slight exertion of force being required.

A splint was loosely applied to the forearm to maintain it in a fixed supine position, and cold lotions to the joint.

The following day there was more swelling and an extensive vivid ecchymosis around the joint. The swelling and ecchymosis gradually disappeared, and the splint was removed in the course of two weeks, and he soon regained the perfect use of the joint.

The position of the head of the radius was first upon the front surface of the outer condyle of the humerus, and on the sudden flexion of the forearm made at the first part of the examination when he was under the influence of chloroform, it was carried upwards and inwards on to the lower part of the humerus, thus giving rise to the crepitus and to the prominence at the bend of the elbow.

CASE 6. *Wound of the radial artery; compression; secondary hemorrhage; ligature.* — Of the surgical aphorisms laid down by Mr. G. J. Guthrie, in his *Commentaries on Surgery*, none are supported with so much ability and enforced with such copious illustrations as those relating to wounded arteries. Commenting (page 221, *Commentaries*) on his aphorism that "no operation should be performed on a wounded artery unless it bleed," he adds, "unless the hemorrhage should be so severe or so well marked as to leave no doubt of it being from the main trunk of the artery itself; *nor is it then advisable to do so unless the artery continue to bleed.*"

It is to suggest that the latter part of this rule is too broadly laid down, and is not the best applicable to the surgical treatment of certain arteries when wounded, that the following case is related :—

November 21*st*, 1859. L——, a workman in the Ordnance Department at Camp Floyd, Utah, aged about 23 years, was wounded by a piece of a large musket percussion-cap, which exploded, and was driven into the lower part of his right forearm, immediately over the radial artery. The wound, though small, was directly transverse to the course of the artery, and was immediately followed by a copious jet of hemorrhage, which was going on when he came to me. The piece of cap was felt with a probe at considerable depth, embraced by and imbedded in the tissues. It could not be removed through the existing wound, and with the view of tying the vessel if necessary, a short incision was made in the course of the vessel extending above and below the wound, and an irregular-shaped, sharp piece of cap removed. On the extraction of the cap, the hemorrhage, which had come in a jet so marked as to make it certain the artery was wounded, ceased; and though the wound was left open for half an hour, the muscles of the part thrown into action, and such gentle violence used as seemed justifiable, the bleeding did not recur, and, therefore, relying on the rule not to tie an artery unless it continues to bleed, I did not secure it by ligature, but brought the edges of the wound and incision closely together with adhesive straps, and applied a compress and bandage up to the middle of the forearm.

Two days afterwards, as he complained of pain in the part, I removed the dressing and found some redness extending several inches up the forearm, and the edges of the wound bathed with a little pus. Lead-water was applied, and in three days more the redness had disappeared, and the wound seemed nearly healed.

On the 30th, nine days after the receipt of the wound, he intended to resume his work, but on rising suddenly from bed at an early hour of the morning, the wound commenced to bleed very freely. He came to me at once, and I found copious hemorrhage going on, which, however, was easily restrained by pressure. He stated that a few days before a good deal of pus had come from the wound. I made an incision in the course of the artery in the line of the previous one, though longer, when the parts were found so thickened and agglutinated that, in the imperfect light of an early winter morning, I could not readily secure the vessel, though the bleeding point could be seen in the centre of an inflamed-looking mass; and as the bleeding was easily controlled by pressure, I applied a compress and bandage, intending to ligate the vessel in the course of the morning when a better light could be obtained.

Later in the morning the patient was seen in consultation with Surgeon Porter and Assistant Surgeon Getty. As the compress controlled the hemorrhage so effectually, it was then determined to continue its application, and in case this should fail or give rise to much swelling and inflammation of the arm (objections which were strongly urged against this treatment), that the vessel should be tied above and below the wounded point, where the tissues were more sound. Accordingly, a compress and bandage were carefully reapplied over the whole forearm.

The following day he complained of a feeling of tension in the parts, and on the next the bandage was found wet with pus.

On the 4th December, four days after the first recurrence of the bleeding, free hemorrhage again took place from the wound, late at night. On removing the dressing the wound bled very freely; I placed a firm piece of dry sponge over the bleeding point and applied a bandage which controlled the hemorrhage, intending to ligate the vessel by daylight.

In the course of the morning I proceeded to tie the artery in the presence of several medical officers. The forearm up to its middle was red and much swollen; on pressure a half ounce of pus exuded from under the tissues about the wound, the seat of which was of a dark-ashy colour. After endeavouring to secure the vessel at the wounded point, which was ineffectual owing to the disorganized condition of the part, I extended the incision downwards, but before the vessel could be found, very profuse bleeding occurred from a long surface in the tract of the wound, when I carried the incision upwards, and, after a tedious dissection, secured the vessel two inches above the bleeding points. This checked the hemorrhage but partially; arterial blood continued to well out from the lower part of the wound; the dissection, for such it was, was now continued below, and another ligature applied below the wound in the artery, when the hemorrhage, which had been restrained by pressure, at the bend of the elbow, completely ceased. Notwithstanding the application of these ligatures, the pulsation of the vessel below the lower ligature could still be distinguished, and was doubtless caused by the current from the superficialis volæ from the ulnar artery, which thus kept up the hemorrhage after the application of the first ligature, for on tightening the lower ligature all pulsation ceased above it on the cardiac side.

The operation was exceedingly tedious; the whole incision, which was 4½ inches in length, being through an undistinguishable mass of inflamed, swollen, and suppurating tissue, and the calibre of the artery itself exceedingly contracted.

The wound gaped very much; stitches were inserted above and below, and adhesive straps applied, but the edges could not be brought together, and the whole forearm was enveloped in lint kept constantly wet with ice-water. The following day the arm was less swollen, and on the succeeding day there was healthy suppuration in the wound, and the tissues were less infiltrated. On the fourth day after the operation the swelling had nearly disappeared, union was taking place, and the application of the ice-water was discontinued; a slough was detached from the site of the original wound, it rapidly healed, the ligatures came away in due time, and the patient was discharged cured on December 26th, twenty-two days after the application of the ligatures.

In this case it is seen that the artery was *known* to have been wounded at first; a reliance on the rule of treatment quoted above led to the treatment by compression, which not only proved ineffectual, but also gave rise to a diseased condition of the parts, which rendered the application of ligatures, ordinarily sufficiently simple, much more difficult and distressing to the patient than it would have been at first.

In view of this case then the idea may be entertained, that when an artery is known to be wounded, and it can be secured by an operation which will not entail more risk than that of probable hemorrhage, it should be tied, even if it does not "continue to bleed;" and this modification of Mr. Guthrie's rule may perhaps be most advantageously applied to arteries superficial in site, as the brachial in its whole course, the radial and ulnar, the posterior tibial near the heel, and others of less importance, in which it is not difficult to be certain whether or not the main trunk of the vessel itself be wounded.

In these vessels no evils can arise from the obstruction of the current; the application of a ligature above and below the wound is ordinarily easy of performance, and destroys all chance of a recurrence of hemorrhage; and in this respect has special advantages in field operations with troops, where it is generally impossible to afford the attention and rest so indispensable in cases where ligatures have not been applied.

FORT FAUNTLEROY, NEW MEXICO, February, 1861.

ART. IV.—*Experiments to determine the Effect on the System of the Asclepias Syriaca.* By CHRISTOPHER JAMES CLEBORNE, M.D., Assistant Surgeon U. S. N.

THE Asclepias Syriaca has long been in use amongst the negroes of the south as a remedy for gleet, gonorrhœa, scrofula, &c., and is a common ingredient in many of the Indian cough nostrums of the present day. Empirics have extensively employed the root and other portions of the plant with more or less success. The most usual mode of administration is in powder or infusion, the latter, made by taking a small handful of the bruised fresh root, boiling it in four pints of water until it is reduced to three pints, and then adding a pint of whiskey; the last mentioned article is added to preserve it, and probably also to increase its diuretic properties. Old cases of gleet of many years' standing are reported to have been cured after other remedies had failed by taking a wineglassful of the infusion of the fresh root three times daily before meals.

It occurred to me that it might be well to test its effects upon the system in health, when taken in the form and dose usually administered. I therefore made an infusion of the dried root of the usual strength, and took it in the dose of a wineglassful three times a day (being at this time in perfect health). I continued its use for five days without observing any other effect than a slight sensation of nausea and an increased flow of pale-coloured urine which was of lighter specific gravity than usual. I increased the dose to a wineglassful four or five times daily, which produced, in addition to the effects before mentioned, vomiting and ardor urinæ.

An infusion of the fresh root, made of the same strength, had the same effects in a more marked degree, and in one-third of the dose of the infusion obtained from the dried root. I now determined upon making different preparations of the root, flowers, and other parts of the plant in order to test more fully the medical effects of each upon my own system. I expressed a quantity of milky juice obtained from the fresh herb, and evaporated it slowly in a porcelain capsule over a water-bath at a low temperature to the consistency of an extract; this preparation was of a dirty colour, and disagreeable acrid taste. Of this I took at first three grains and gradually increased the dose up to five grains three times a day, when I had to discontinue its use on account of the excessive nausea, tickling sensation in the fauces, and a violent headache, confined principally between the eyes. From the flowers I made a watery infusion and evaporated it to the consistence of an extract which was exceedingly bitter and had but little of the properties peculiar to the rest of the plant. A fluid extract was now prepared from the dried root by the following process: ℞.—Asclepiadas syriacæ contus. ℥xvj (Troy); ether sulphurici f℥iv; aquæ communis q. s.; spts. vini rectif. f℥x. Bruise the root fine so that it can pass through a sixty sieve, pack in a percolator such as is used for preparing ethereal tinctures, &c., and moisten it with a menstruüm of alcohol and ether f℥vj of the former to f℥iv of the latter, displace very slowly, and place the first tincture aside, then displace with the rest of the alcohol and water q. s. until the root is completely exhausted; evaporate this in a porcelain capsule over a water-bath, then add the ethereal tincture and evaporate to one pint. This forms a preparation of a beautiful rich red colour, exceedingly bitter in taste and of an aromatic odor; each fluid drachm representing an ounce (Troy) of the root.

Having now a preparation of known strength, I began to try its effects upon the system, and accordingly on the 24th July, 1859, I took it in the dose of ten drops, gradually increasing the quantity until nearly ʒij daily were taken in divided doses of ʒss with the following effects:—

July 24, 10 A. M. Took ten drops of fluid extract asclepiados without any peculiar effects being observed.

25*th*, 9 A. M. Took gtt. 10 in syrup. zingib. to disguise its disagreeable taste, and at noon took gtt. 10 more; this produced a decided increase of secretion from the kidneys.

26*th*, 11 A. M. Took gtt. 20, at 2 P. M. gtt. 20 more; this produced an increased flow of urine, dizziness in the head (which lasted only a couple of hours), and a tickling sensation in the fauces.

27*th*, 11 A. M. Took gtt. 30, and at half past 2 P. M. gtt. 20 more; this had the effect of producing increase of secretions of kidney, tickling sensation at the end of the penis, uneasiness of stomach, slight inclination to evacuate bowels, severe headache, quick full pulse, 92 per minute.

28*th*. I awoke with a severe headache, and a disagreeable feeling about the stomach, I therefore discontinued taking the medicine until the 30th.

30*th*, 12 A. M. Took gtt. 35 in cinnamon water, which in a few hours produced nausea, and an inclination to evacuate the bowels, slight pain in the stomach and diuresis. At 3 P. M. took gtt. 15, combined with tr. opium camph. gtt. v, and syrup. ginger. ʒj. At 8 P. M. had a copious evacuation, soft consistence and brown in colour, accompanied by a slight pain in the bowels. The action of the heart seems to be increased; pulse 98 per minute.

31*st*. Took gtt. 40 at 11 o'clock. This produced vomiting, leaving the system much relaxed and pulse feeble and frequent.

Aug. 2. Took ʒss at 10 A. M., and at half-past twelve P. M. took gtt. 30 with three drops of tr. opii; this produced vomiting which was severe and long continued, leaving behind it a sensation of rawness in the stomach and a slight pain, coldness of surface of skin, feeble pulse, and a feeling as if some sharp instrument was thrust through from one temple to the other.

3*d*. Took at 9 A. M. gtt. 20 with gtt. xv tr. zingib. and gtt. 3 tr. opii. At 12 P. M. had an evacuation, soft in consistency and yellowish in colour; appetite much increased. I observed no other effects; probably by this time the stomach had become used to the medicine, and its nauseating effect was not produced. The secretion of urine was normal; pulse regular and there was no headache.

I continued taking the fld. ext. asclepiados, gradually increasing the dose until the quantity taken amounted to ʒiiss in ʒss doses three times a day, and at bedtime ʒss combined with tincture of ginger and some aromatic water. As my health, and the circumstances in which I was placed would not allow of my experimenting upon myself further, I discontinued the medicine, it having occasioned violent vomiting, with retching, burning, and tickling sensations in the throat and fauces; stomach feeling painful and raw; increased secretion of bile; copious discharges from the bowels of soft fluid consistence, yellowish in colour and attended with some griping pain; headache; sense of constriction across the forehead, sometimes pain between the eyes; excoriation of anus; increased appetite. I prepared a fluid extract from the fresh root, and by the same process that I have mentioned before in this paper.

7*th.* Took of this preparation gtt. 15 with tr. ginger. ʒss t. d.; this produced two pleasant copious evacuations, without pain or other unpleasant effects.

Throughout these experiments the appetite seemed to be very much increased; even after making a hearty meal a feeling of hunger would in the course of a few hours be again felt.

I found that by taking 15 to 20 drops before breakfast, a gentle aperient effect was produced in the evening.

The preparation made from the fresh root is nearly one-third stronger than that made from the dried root. An infusion of the root, or a decoction made with water seems to take up its bitter taste with very little of its active principles. The infusion will not keep very long.

The hard extract in the dose of from 3 to 5 grs. t. d. gradually increased, produces the same effects as the fluid extract; it is made by evaporating the fluid extract down to the consistence of a hard extract.

Anodyne, diaphoretic, emetic, stimulant, expectorant, and tonic effects have been ascribed to this root. Dr. Richardson, of Massachusetts, found the root possessed of anodyne properties. He used it in asthma, typhus fever attended with catarrh, &c., and found it to relieve pain, promote expectoration, and relieve dyspnœa. (U. S. D.) I must say I did not observe any anodyne effects produced by it in any of the doses mentioned in this paper.

With all due deference to Dr. Richardson's statement, I think it is likely he employed some other plant, belonging to the genus, than the Asclepias syriaca that may possess the property he attributes to it.

The effects of every dose were marked with particular care, and it did not in any instance act as an anodyne. It is a stimulant; in my own case I found it increased the action of the heart. As an expectorant I can give no opinion about its effects, not having an opportunity to try it, though it has been favourably spoken of as such by many physicians. I do not think that it can be considered as a diaphoretic, at least not more so than other articles of mat. med. which produce a nauseating effect upon the system. That it is a purgative there can be no doubt. I have used it in many cases, and there are advantages which it possesses over many of the vegetable cathartics now in use.

I consider it to be *tonic, alterative, diuretic, purgative, emetic,* in large doses, *stimulant* and *anthelmintic.*

The following cases which have come under my notice prove that it is possessed of valuable medical properties well worth the attention of the profession.

J. A. B., æt. 30 years, had been suffering for some years with constipation of the bowels, pains in the right side and lower extremities, loss of appetite, &c.: gave him the following mixture: ℞.—Ext. fld. asclepiados ℥ss; Syr. zingib. ℥iiss. M. ft. mist. Sig.—ʒj twice daily, to be increased to a teaspoonful three or four times daily. At the end of a month he felt much relieved, his bowels became regular, his appetite improved, to use his own words, "became almost too good for his means," and the pains in his limbs were entirely removed.

H. Y. L., a young man of somewhat irregular habits, had been suffering from constipation of the bowels for over two years, being sometimes four or five days without a passage; he had used drastic cathartics, which he said, after their effects had been produced, made him much worse. He was also troubled with hæmorrhoids. He took the fluid extract in doses of gtt. xx t. d. increasing the dose up to fʒss twice daily. He rapidly improved under this treatment; his bowels have been open every two or three days, soft pultaceous stools being procured without any straining effort. The hæmorrhoids disappeared by applying to them an ointment composed of ℞.—Acid. tannic. ʒss; Ungt. glycerin. ℥j.—M.

T. S., æt. 22 years, labouring under an attack of primary syphilis. On examination I found three good-sized chancres on glans penis, one on frenum and one on each side of glans; on each side an indurated syphilitic bubo. This patient was so susceptible to the influence of mercury that half a grain of any of its preparations would produce the characteristic effect upon him.

I touched the chancre with sulphate of copper, dressed them with lint dipped in vin. aromat., applied pressure to bubo by means of a compress and bandage, and placed patient on a low diet of rye bread and buttermilk, and administered fld. ext. asclepiados gtt. xx three times daily, combining it with syrup of ginger and tinct. opii when it produced nausea.

The patient, who had no appetite and was much debilitated, rapidly recovered under this treatment; his appetite returned; the bubo disappeared; the chancres cicatrized kindly; the bowels were regularly moved once and sometimes twice daily; his system gained strength, and in less than three weeks he had entirely recovered.

An old case of dyspepsia of some years standing improved quickly under this treatment; a diet of buttermilk and rye bread, and the following prescription. ℞.—Ext. fld. asclep. syriacæ ʒiij; Tr. nucis vomicæ gtt. xxvj; Syrup. zingib. f℥iiss. Misce et ft. mist. Sig.—ʒj t. d. Buttermilk I believe is very useful in many cases of dyspepsia; it has the advantage over fresh milk of not constipating the bowels.

Katy D——, a child aged eight years, affected for some time with ascaris vermicularis; she was much emaciated, and her system seemed completely broken down. I placed her on the rye bread and buttermilk diet, and gave internally ext. fld. asclepiados gtt. x t. d. and injected into the bowels ʒij of the ext. in 8 oz. of mucilage of flaxseed. A large number of worms were discharged, and the child rapidly regained its strength.

I have heard of other cases in which asclepias syriaca has been used as an anthelmintic and with great success.

During the short time I was in the South, I had but little time to investigate the properties of this drug; but I entertain the hope that I shall soon have further opportunity to test more fully this valuable remedy.

Art. V.—*On the Antagonistic Effects of Opium and Sulphate of Quinia.* By Nelson Nivison, M.D., of Hector, Schuyler County, N.Y.

That opium and quinia, when administered "simultaneously" as remedies, react upon each other, and to some extent countervail each other, is a fact which appears recently to have arrested the attention of numerous observers. Though we are prepared to admit that in a qualified sense they are "antidotes to each other" each neutralizing the *bad effects* of the other, we cannot subscribe to the rule lately laid down by Dr. Gubler, that "they ought not to be administered simultaneously."[1]

We claim, on the contrary, that it is precisely in virtue of the fact that these remedies do react upon each other when simultaneously administered, that the happiest therapeutic results are often produced, differing essentially from the separate action of either.

So true is this, so important the principle involved, so extensive its range of application, so certain and satisfactory the results, that it is believed that few of the recent improvements in practical therapeutics, have added more largely to our resources than that derived from the *combined* action of these remedies.

At the present time, perhaps no two remedies enter more largely into the general therapeutics of this country than the preparations of bark and opium. There is scarcely a disease in which their virtues have not been tested, often by many and able observers. Some of their properties have been determined with a certainty that amounts to absolute demonstration, others have now won the confidence of a majority of the profession, while other claims put forth with equal assurance have as yet failed to secure that confidence which a frequent use would necessarily imply.

Under such circumstances, any investigation which promises clearer light in regard to the properties and remedial effects of agents so powerful as these, can but be a matter of interest, not alone to the medical philosopher, but especially to those who assume the practical duties of the healing art.

Before proceeding to the discussion of the conjoint action of opium and quinine, it may be well to notice some of the phenomena produced by their *separate* action.

Perhaps we cannot give the general and more obvious effects of opium better than to quote Dr. Gubler. He says: "Opium carried into the circulation induces a particular excitement, gives volume to the pulse, exalts the temperature, augments the capillary injection of the skin, and excites diaphoresis." To this we may add that while operating thus on all parts of the system it is sometimes directed with peculiar force to the brain, often producing intoxication or delirium. This is usually followed by an agreeable mental placidity, and soon all consciousness is lost in sleep.

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[1] Journal des Connaissances Med. et Pharmaceutique, Aug. 30, 1858.

With Dr. Gubler, we will say of quinia that its effects on the circulation are inversely to those of opium. It gives tone, or contractility to the capillaries, and thus overcomes congestion. It is anti-periodic and sedative. As incidents of its operation, we have various phenomena which indicate that it often produces great disturbance of the nervous centres.

But no mere outline of this character will give to the inquiring student an adequate idea of either the *modus operandi*, the physiological, or therapeutic effects of these articles.

'Tis the latter only which, on the present occasion, chiefly interests us. And it is only by studying their relation to certain pathological conditions that we shall be likely to arrive at a definite understanding of them.

Of their physiological effects we will simply say that both opium and quinia have a powerful affinity for the nervous system, each impressing it in a manner peculiar to itself and through its agency modifying the action of every organ in the performance of its function. Whether, as has been assumed, opium acts through the cerebro-spinal, and quinia the ganglionic system it is not now our purpose to inquire.

That quinia has a powerful affinity for the nervous system we think will hardly be questioned. If any doubt should exist, the fact, we conceive, admits of demonstration. It is a law of the animal economy that no function can be performed without loss of substance. Muscular motion implies a loss of fibrin, and any activity of the brain and nervous system involves a corresponding metamorphosis of their tissues. The waste of nerve-tissue, or, in other words, the activity of the function of innervation, is easily calculated, being in a direct ratio to the sum of the phosphates found in the urine.

From carefully conducted experiments it appears that quinia given in a state of health augments the amount of the phosphates, and consequently increases nervous action.

But it is in morbid states of the nervous system that the more striking effects of quinia are exhibited. Dr. Ranke (*Med. Times and Gazette*, May 30th, 1857), while conducting a series of experiments for determining the effects of ague and quinia on the urine, ascertained that the paroxysm of fever greatly increased the amount of phosphoric acid. Showing most clearly that the nervous system plays an important part in the paroxysm of ague. Dr. Hammond (*American Journal Med. Sciences*) found, while experimenting on himself during an attack of intermittent, that, on the day of the first paroxysm, the amount of phosphoric acid found in the urine was 69.18. Next day (intermission), 52.95. Third day (paroxysm), 72.95. Fourth day (intermission), 55.27. On this day, quinia was administered. The next day, being the one for the paroxysm, and when the amount of phosphoric acid, calculating from the average of the preceding days, would have been 71.06, it fell to 56.22—but a trifle above that excreted on the days of intermission.

But rapid disintegration of nerve-tissue is not confined to intermittents. It is usually a prominent element in nearly all the severer forms of fever. The general debility and non-performance of function are, doubtless, due to this cause. Continued experiment led Dr. Hammond to the conclusion that "Quinia has the power to prevent much of this great waste of nerve-material." We will add that it not only prevents destruction of nerve-tissue, but, by its well-known effects on the function of nutrition contributes greatly to the *reparative* process. It may, therefore, be justly entitled a great conservator of the nervous system in conditions of febrile excitement or nervous prostration.

But the influence of quinia is not confined to the nervous system. It has important relations to the circulation, and the character and quality of the blood. Headland believes "that its action is exerted primarily on the blood and not on the nerves." We will not discuss that question on the present occasion, nor is it necessary to our present purpose. All the vital functions are so intimately connected that no one is independent of all the rest.

The more obvious and important effects of quinia will alone be noticed; and, among these, none is of so much importance, as its power of giving contractile action to the capillaries.

This power appears to extend to all parts of the capillary system. Dr. Corrigan, Physician in Ordinary to the Queen in Ireland, says: "Quinia appears to possess the same power in giving contractility to the capillaries in the lungs which we know it to possess in so marked a degree over the capillaries and venous radicles in the spleen."

This property of quinia gives us a power over almost all forms of venous and capillary *congestion* which, perhaps, it is impossible to obtain by any other known agent.

Another effect of quinia on the circulation is that of approximating the frequency of the pulsations to the healthy standard, when much too frequent or much too slow.

We may incidentally mention that quinia enters the bloodvessels, and goes the rounds of the circulation. Tiedeman and Gmelin found it long ago in the blood of a patient to whom it had been administered, and if we needed further confirmation, we have it in the fact that in from three to twelve hours after its administration it will appear in the urine. Dr. Bence Jones, M. Briquet, and many other authorities might be quoted on this point.

Quinia not only influences the circulation, but it works important changes in the character of the blood itself. We have already had occasion to notice its influence on the phosphates. Its action in diminishing the amount of uric acid is still more striking. Dr. Ranke experimented on three healthy individuals. He found that under the influence of quinia the amount of uric acid was reduced nearly one-half. Dr. Hammond made a series of observations during an attack of intermittent fever, where, as in all fevers, the amount of uric acid is always greatly increased. Here, likewise, the quantity was promptly reduced more than half by the action of quinia.

But perhaps the most remarkable effect of quinia on the blood is the fact that it *defibrinates* it, and renders it fluid and incoagulable. This fact, mentioned by Dr. Samuel Gordon in the *Dublin Quarterly* for August, 1856, and clearly established by the experiments of Baldwin, Melier, Briquet, and other responsible authorities, may throw some light on its action in preventing and overcoming congestion, and subduing many forms of inflammation.

The diseases to which quinia is specially adapted usually contain an important neuropathic element. The innervation may be either deficient, irregular, or excessive; all, however, imply the existence of, or ultimately produce nervous debility. Many derangements of circulation, nutrition, secretion, sensation, and muscular motion, are included as sequelæ. An example of excessive innervation is manifest in precocious children. The vivacity, intellectual and moral development indicate a degree of nervous activity altogether disproportioned to the restorative or nutritive function. Early decay is the result.

The diseases accompanied with derangement of circulation are attended with general or local congestions. Conspicuous among them are the intermittent, remittent, continued, and pernicious fevers, and many diseases usually regarded inflammatory. Derangements of secretion, excretion, and calorification, follow in the train of disordered circulation, and imply disturbance of the ganglionic system.

Quinia is also adapted to many diseases originating in the cerebro-spinal system, as chorea, neuralgia, &c.

Of the general properties of opium, the "antagonist" of quinia, we shall speak very briefly.

One of the most important properties of opium is that of a general stimulant to the vital powers. Says Mr. Skey, the eminent Surgeon of St. Bartholomew's Hospital: "There is no drug, simple or composite, known to our pharmacologists, that possesses an equal power with opium in giving energy to the capillary system of arteries, of promoting warmth, and thus maintaining an equable balance of the circulation throughout the body."

This property of opium, that of *equalizing the circulation*, is an invaluable one. There is scarcely a pathological condition in which it is not desirable, and without this agent sometimes difficult or impossible to obtain.

Opium not only accelerates the circulation when it is feeble, but it moderates it when excessive. This may appear paradoxical, but we think it admits of a ready solution. The circulation is subservient to innervation. While the nervous system maintains its tone, the disturbing cause must be very considerable or long continued, or the circulation will remain uninfluenced. When in an atonic condition, very slightly irritating or exciting causes will hurry the circulation. We believe a rapid pulse always implies deficient innervation. Opium is a direct stimulant of the nervous system; it supplies for the time being the necessary power of resistance to the nervous centres, the effect of the disturbing cause is neutralized, and the circulation regains its equilibrium.

Another remarkable property of opium is the effect it has over the nutritive or reparative function. We see illustrations of this in the fact that *old ulcers* which have resisted all other means of treatment will readily heal when the system is brought under the influence of that drug. Its effects on obstinate chancres, senile gangrene, chilblains, &c., are examples in point.

A point that demands a passing notice is the general *derivative* effect of opium. By determining to the surface, internal parts are relieved of undue accumulations. In this way we can often spare the system the irritation and exhaustion that would result from counter-irritants.

We will mention still another point of great practical value, and that is the property which opium possesses of *retarding the too rapid metamorphosis of the tissues.* This enables us to maintain the integrity of the organism in exhausting fevers, wasting discharges, long-continued exposure to cold, or any protracted mental or physical suffering.

The more familiar effects of opium in removing pain, allaying irritation, procuring sleep, &c., we have not space here to notice. Enough has been written, we trust, to render it apparent that a multitude of pathological conditions demand the benefit of its influence. It is not only adapted to the inert condition of the remote vascular system, but it subdues active inflammation, and acts as a true life-sustainer when we are compelled to meet the protracted suffering incident to our frail mortality.

It is obvious that each of these "antagonistic" remedies of Dr. Gubler has a wide range of application. But the question arises: Can the several effects that we have imputed to them be confidently relied on when administered in the several pathological conditions that we have indicated? We readily admit many and various exceptions; but we claim that the number of these exceptional cases will be greatly reduced *when the two remedies are given simultaneously.*

Some of the exigencies demanding a combination of these remedies will now be indicated.

1st. There are many acute inflammatory conditions that will promptly yield to the influence of full doses of opium, where those doses cannot be given without the risk of so far paralyzing the nervous energies as to induce fatal congestions. We have seen that quinia possesses pre-eminetly the power of giving contractile action to the capillaries, and thus overcoming congestion; and experience has amply demonstrated that if the proper amount of this be combined with the opium in the class of cases above referred to, as much of the latter may be safely administered as may be requisite to produce the effect desired.

2d. A frequent objection to the free use of opium is its tendency to so far reduce the biliary and renal secretion as to incur the risk of fatal toxæmia. Combined with quinia this tendency is to a great extent counteracted.

3d. Opium frequently reduces the respiratory action to such an extent that we are liable to have all the evils incident to imperfectly aerated blood. If, under these circumstances, we invoke the "antagonistic" effects of quinia, these unpleasant consequences are usually averted, while all the desirable effects of the opiate are retained.

4th. The *after effects* of opium are frequently so unpleasant as to neutralize or perhaps overbalance all the good that would otherwise result. These usually do not appear when the remedy is administered in combination with quinia.

5th. In many cases of extreme exhaustion, such as follows protracted hemorrhages and other like debilitating causes, we can temporarily arouse the energies of the system by the free use of opium; it is in fact the sheet-anchor; often the only hope. When the sensibilities of the system are thus reduced, the toleration of this drug is often truly astonishing. Under these circumstances, however, it not unfrequently happens that the quantity which is barely sufficient to produce the reaction is yet sufficient when it *does* occur to produce unpleasant narcotism. If in these cases we give quinia with the opium, we not only secure the desired action with a less amount of opium, but the more protracted operation of the quinia will enable us to maintain the reaction for any desired length of time without those frequent repetitions of the opium that would otherwise be necessary.

We may mention in this connection that persons who from accident or design have taken *overdoses* of opium and are found in a state of narcotism, are often promptly aroused by the administration of a full dose of quinia. This is especially the case in young children, who usually tolerate opiates very badly.

6th. Many patients from idiosyncrasy cannot take opium. When given in combination with quinia a large proportion of these persons take it without inconvenience.

We might multiply these examples were it necessary; but if we are thus far correct, quinia is a valuable adjuvant and often corrects the unpleasant effects of opium.

It may perhaps serve to illustrate the foregoing propositions to state that other agents than quinia, as the peculiar mental condition of lunacy, the continued effect of cold, &c., will sometimes neutralize the bad effects of opium without impairing the good ones. Mr. Skey being obliged to ride all night in December when he had forgotten his overcoat, says: "After riding ten miles I took twenty-five drops of laudanum, and rode the remainder of the night without inconvenience." He says, it may be asked "What was the effect on the following day?" and replies, "None whatever. The cold and the opium mutually balanced each other; there could be no reaction, for the duration of the cold exceeded that of the opium."

I am inclined to think the action of the quinia in this regard analogous to that of the cold. The duration of its action generally exceeds that of the opium, thus supporting the system till the effects of the opium shall have passed away.

On the other hand, certain well-known effects of *quinia* are often desirable where, from peculiarity of circumstances, we either cannot obtain them, or, doing so, we bring with them such an undesirable train of concomitants that we are forced to dispense with the article altogether. We will notice a few of these peculiarities very briefly.

1st. The prominent feature of many diseases is dangerous *congestion* of some internal organ or organs. Here the well known action of quinia in giving contractility to the capillaries of congested parts is exceedingly desirable; but where, on trial of the remedy, we find we have imparted only a peculiar *excited* action to the general circulation, under the influence of which the congestion is aggravated rather than relieved. The addition of a sufficient amount of opium to control this excitement will not only insure the legitimate operation of the quinia on the capillaries, but by diverting the general circulation to the surface, aids still further in overcoming the congestion. In this class of cases either opium or quinia acting alone would almost certainly add to the existing congestion ; *in combination* the bad effects are neutralized, and the two remedies co-operate in producing the desired relief.

2d. There are many forms of *inflammation* to which, *mutatis mutandis*, the above remarks will apply with equal force. Judicious combinations of the remedies in question will often give us the most perfect control of the vital forces, and enable us to fulfil the various indications in the most satisfactory manner. There are many points of interest involved in this branch of our subject, in the discussion of which the limits of our article forbid us to enter. (For much that is valuable on the points here involved we refer to the *Dublin Hospital Gazette* for July, 1856, and the *Dublin Quarterly* for August of the same year.)

3d. There is another great class of diseases in the treatment of which quinia is almost indispensable. I allude to the idiopathic fevers. Here also we are liable to have various disturbing symptoms demanding the use of opiates. Experience has demonstrated that they may be combined with quinia with the most beneficial results.

4th. There are various affections usually denominated neuralgic, which are palliated by opiates and sometimes *cured* with quinia. These cases will often yield more speedily to the *combined* influence of opium and quinia than to any other known remedies.

5th. There are numerous morbid conditions belonging to the *neuroses*, often associated with anemic states of the system where the true etiology of the disease can doubtless be traced to *defective nerve nutrition*. We have already had occasion to notice the action of both opium and quinia in modifying and improving the function of nutrition. In the present state of our knowledge there is nothing that would preclude the idea that this improved nutritive action may extend to the nerve tissue. But whatever the rationale, the fact remains that very many of these neuropathic conditions will yield to the combined action of these remedies.

We are forced to the conclusion that opium and quinia are not so far "antagonistic that they should never be administered simultaneously," as maintained by Dr. Gubler.

Art. VI.—*Three Cases of Vesico-Vaginal Fistula, successfully treated by Sims' Method.* By J. Mercer Adler, M. D., of Davenport, Iowa. (With five wood-cuts.)

Case I. The entire history of this case is interesting; the writer is acquainted with all the circumstances connected with it. The patient, Joanna B., ætat. 21, was taken in labour with her first child on Tuesday, May 22d, 1860. She is a woman of below the ordinary stature, compactly built, and of sanguine temperament. The labour progressed slowly until Thursday, the 24th, when the regular medical attendant was called. On Friday, the 25th, at noon, I was called in consultation with Dr. M'Cortney to see her. The child was dead. The head was impacted in the pelvic cavity, the vertex presenting at the vulva. The cause of the obstruction to delivery was found to be too great curvature of the coccyx, which we subsequently learned to have been the result of a fracture of the bone from a fall in early life. Craniotomy was at once decided upon, and the child was extracted with the blunt hook introduced into the foramen magnum.

The woman subsequently did well. In a week she was up attending to her household duties. On Thursday, June 21st, while at work, she suddenly felt the urine trickling from the vagina. Up to this time she had regularly passed the urine without inconvenience, but having a slight diarrhœa in the morning, accompanied with some tenesmus, she attributed the difficulty to her straining while at stool. On visiting her the day following with Dr. M'C., and making an examination of the vagina, we found an extensive slough three-fourths of an inch in length by nearly half an inch in width, in the vesico-vaginal septum, its long diameter being transverse. The slough had only partially separated and could not be detached. The entire surface and edges were freely cauterized with nitrate of silver, a curved catheter introduced, and the patient put on her back, in the hope that as the slough separated, the granulating surfaces might repair the breach of substance and the opening be closed. This treatment was followed from day to day, but the slough finally separated, leaving an irregular hiatus about three-fourths of an inch in length by half an inch in breadth, its anterior edge semicircular, the posterior one irregular and wavy in outline, above the edge of which the mucous membrane of the bladder protruded. The case was evidently one to be remedied only by an operation, with a view to the preparation for which, the parts were occasionally touched with the caustic, well cleansed, and the patient's general health improved.

The case is remarkable so far in this respect, that the patient should have been going about, attending to her duties daily with such an extensive amount of disorganization of the tissues of the vagina in progress, without being conscious of any uneasiness. The sloughing was doubtless the result of the long-continued pressure of the child's head against the pubic arch, causing arrest of circulation and consequent destruction of the vitality of the tissues. It may here be stated that during the whole time of labour the woman regularly evacuated the contents of the bladder.

On Saturday, August 4th, assisted by Drs. Witherwax and M'Cortney, the following operation was performed: the bowels had been well moved the evening previous. The woman being placed in position, and the speculum of Sims introduced, a silver catheter was passed into the urethra and pushed firmly against the fundus of the bladder so as to bring it as much on the stretch as possible and retract the protruding mucous membrane. The posterior edge of the fistulous opening being caught in the middle by a strong pair of toothed forceps and well lifted up, the point of a curved knife was thrust in under the hold of the forceps at the edge of the mucous membrane of the bladder, and brought out about a quarter of an inch beyond in the vaginal mucous surface. The edge of the knife was then steadily pushed along with a sawing motion, the hold of the forceps being changed occasionally so as to bring the parts on the stretch, until the corner or angle of the fissure was reached. The same process was repeated on the other side, and in a few minutes the edges were thus easily and thoroughly pared. The angles were clipped out with the curved scissors. A wad of linen wet with cold water was then introduced into the vagina and the patient laid on her side. In about ten minutes, all hemorrhage having ceased, three silver sutures were introduced and brought together. The apposition of the edges being satisfactory, the process of twisting the sutures to their places was performed. In twisting the one on the left an unfortunate accident occurred. Either from an imperfection in the wire, or from its being twisted too tightly, it gave way close to the loop of the suture. Fearing that it might possibly give way (although it held its place), an additional suture was introduced. The ends of the wires were brought together outside the vulva, secured in a piece of tape, and confined to the thigh. The whole time consumed, from placing the woman on her knees to the introduction of the catheter after she was placed on her back in bed, was just one hour. The catheter being introduced, half a teacupful of bloody urine escaped, but it soon became clear. Half a grain of morphiæ sulph. was administered and the patient left for the night, with directions to remove the catheter and wash it every two or three hours.

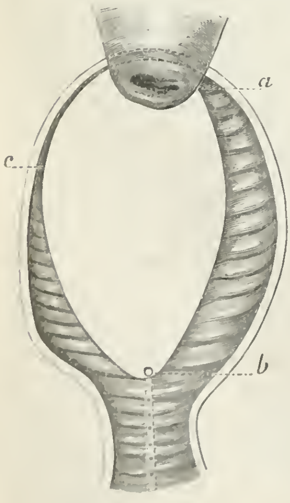
The patient passed a comfortable night, and during the following four days did well. The catheter was withdrawn every three or four hours and washed with diluted muriatic acid to prevent its being filled by the phosphatic deposit, which was quite abundant. On the fourth night and morning of the fifth day the patient suffered from severe headache, pains in the abdomen, nausea, and vomiting. Her condition became so alarming, apparently resulting from the want of action of the bowels, that it was deemed necessary to administer injections to move them. These were repeated several times without success. A bottle of solution of citrate of magnesia, well iced, was then given. It acted freely, and at once relieved the distressing nausea and headache. Subsequently there was no trouble. At the expiration of the ninth day an examination was made, and the union appeared perfect. Two of the sutures were removed. The remaining two were so deeply buried in the tissues that they were left until the following day. On the tenth day everything appearing firm, they were removed with some difficulty from their imbedded positions, and we were gratified to behold a most perfect success.

The line of cicatrization was broad and firm, curved in outline to correspond with the anterior lip of the fissure. The bowels were moved by an enema, and directions given to remove the catheter every two hours for fifteen minutes at a time, during which the patient was to lie on the side. Her back was rubbed with spirits, the vagina syringed, the vulva well cleansed, and the slight abrasion of the internal labia powdered over with oxide of zinc. The catheter was from day to day suffered to be withdrawn for a longer time.

On the thirteenth day after the operation it was allowed to be withdrawn two hours at a time, and at the first effort to pass water without the catheter it flowed freely. From this time it was not again introduced. On the fifteenth day an examination was made; the vagina was found perfectly healthy in appearance, and the only trace of the fistulous opening left was a firm, solid cicatrix.

CASE II. On Tuesday, February 6, 1860, in company with Dr. P. Gregg, of Rock Island, Illinois, I visited Mrs. J. H. S., of Henry County, Illinois, with a view to an operation for her relief. On introducing the speculum of Dr. Sims, a most deplorable sight presented itself for our contemplation. From a point beginning about an inch from the meatus urinarius up to the os uteri there was an irregular oval hiatus, three and a half inches in length, and varying from one to two inches in width, through which a view was afforded of the entire cavity of the bladder. On the right there remained a considerable part of the vaginal septum, its edge ragged and partly cicatrized; on the left and above, the mucous membranes of the bladder and vagina seemed almost continuous, separated only by a broad line of cicatrization which finally lost itself in the cervix uteri. All support from the attachment of the vagina to the anterior segment of the cervix being lost, the os and cervix fell into and blocked up the fundus of the bladder.

Fig. 1.



An approximate idea of the appearance and extent of the fissure may be obtained from the accompanying figure (Fig. 1, one third the natural size), for the general outlines of which and method of representation I am indebted to the excellent drawings of Dr. Bozeman, accompanying his paper on the subject of Vesico-Vaginal Fistulæ, *N. A. Med.-Chirurg. Review*, vol. i. page 576.

The case appeared to be an unpromising one, but, urged by the great anxiety of the patient, and having in our subject a young woman in perfect health, of strong and well-developed muscular fibre, cheerful disposition and regular habits, we determined to attempt an operation, and decided upon the following plan of procedure: First to unite the edges as far up as possible by transverse sutures, and subsequently, if in this we succeeded, to unite the triangular edge of the septum with the anterior lip of the os uteri.

The patient being placed in position, the process of paring the edges was begun at the point *a* (Fig. 1), and carried on continuously around as far as the point (*c*), leaving a broad bevelled edge pared nearly to the extent of half an inch in width. From the point (*c*) up to the cervix a deep groove was made in the tissues with a spade-shaped knife, being guided in making it by the line of cicatrization. The operation of paring the edges was tedious and painful, the hemorrhage being considerable and much obscuring the view. A large soft sponge was introduced into the parts, and the patient allowed half an hour's rest. Strong silver wire sutures were introduced at intervals of nearly half an inch. The points were carried full half an inch from the edge of the mucous membrane of the vagina, and as nearly as possible through at the edge of the mucous membrane of the bladder, and brought out at corresponding points on the opposite side. The introduction of the needles above was extremely difficult and tedious, requiring much manipulation on account of the contracted space afforded by the transverse field of the speculum.

Anticipating as we did a great amount of traction and strain upon the remnant of the septum, we deemed it best to introduce but seven sutures, and to include within the loop of each as much of the tissues as possible. The operation was much facilitated by moving the speculum from side to side, so as to expose only one edge of the fistula at a time. The loops of the sutures when removed measured from an inch to an inch and a half in length each.

After a rest of half an hour, the parts were well sponged and cleansed, and the sutures twisted firmly to their places by means of the ingenious little instrument of Dr. Coghill (Figs. 2 and 3). The ends of the wires were twisted together and confined in the commissure of the thigh and vulva by a piece of tape passed round the thigh. The patient was placed on her back, and the sigmoid catheter of Dr. Sims introduced, through which flowed several spoonfuls of bloody urine with bubbles of air. The patient was left in the care of an experienced nurse, with proper directions as to the management of the catheter; a light diet enjoined, and sulphate of morphia to be administered to allay restlessness or check any disposition to evacuate the bowels.

Dr. Gregg visited her on the 8th; found her suffering from nausea, attributed to the morphia which she had taken. The urine, mixed with mucus and blood, continued to pass through the catheter and required its frequent removal. Dr. G. visited her the following day. Notwithstanding all precautions, her bowels had acted freely the night before. The urine flowed through the catheter with less hindrance. She was then left undisturbed until the 16th.

Fig. 2.

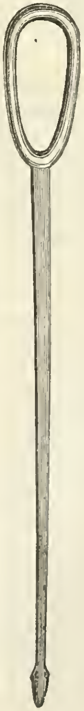
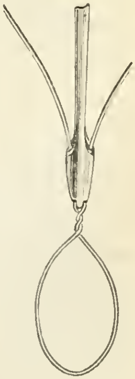
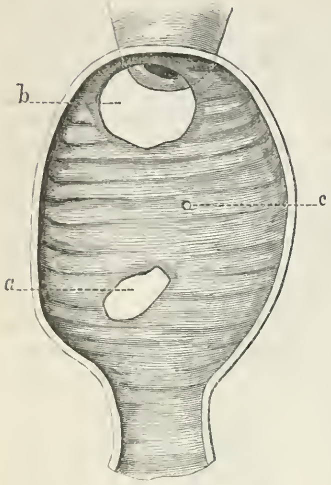


Fig. 3.



The result of the operation may be perceived by a glance at Fig. 4. The parts had failed to unite at the point (*a*), where there remained an opening as large as a bean, and above there was a large fissure bounded by the cervix uteri and the edge of the septum. This fistula appeared about an inch in length, and nearly of equal width.

Fig. 4.



Our operation had succeeded beyond expectation, and we were well pleased with the result.

On the 20th of March we again visited the patient, with the object of closing the lower opening (*a*, Fig. 4), preferring to complete the first stage of the procedure before attempting the closure of the upper fistula, one border of which was to be formed of the anterior lip of the os uteri. The operation was performed with three sutures introduced somewhat obliquely, and the patient was left with the customary directions for management. The sutures were removed on the 28th, union being perfect. The bowels were thoroughly evacuated by a dose of castor oil and an enema. Directions were given to draw off the urine every hour or two until the sphincter vesicæ recovered its tone, and she was able to pass water at will. She was soon able to be up, and retained the urine three or four hours at a time without uneasiness. April 9th was appointed for the final operation.

On making an examination the cicatrix appeared firm, and the entire parts presented a healthy and natural look. The cicatrix measured two and a quarter inches in length; it had contracted much, however, the line of coaptation of the edges at the first operation having been full three inches in length by actual measurement. An unexpected obstacle here presented itself, precluding the possibility of completing our operation as proposed. The cervix uteri was so completely incarcerated in the bladder, and so firmly held in its place there, that it was found impossible to lift it out, so as to form union with the anterior lip of the os. The body of the uterus was so much retroverted that all our attempts to introduce a sound into the uterine cavity, in order to lift the organ from the bladder, proved unsuccessful. In this emergency the simplest and easiest solution of the difficulty was to form union with the *posterior* lip, and thus imprison the os permanently within the bladder; an operation also very acceptable to the wishes of the patient from the fact of its precluding the possibility of the occurrence of pregnancy. The operation was, therefore, thus performed, five sutures being introduced. The sutures were removed April 16th, the parts having failed to unite.

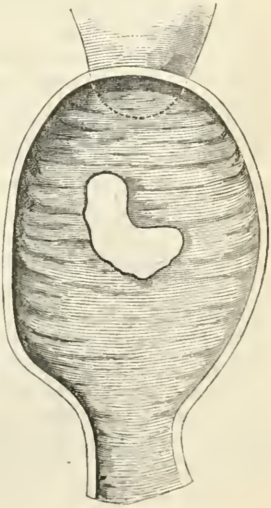
The condition of the patient and subsequent events fully accounted for the failure. The confinement from the previous operations, and the retention of the secretions in the prima via of a person of active and regular habits, was followed by great derangement of the entire nervous system. Obstinate constipation ensued. A slow irritative fever, with delirium, succeeded—the consequence of the absorption of vitiated secretions. The patient was much debilitated and depressed; but under the judicious and vigilant care of her accomplished medical attendant, Dr. Gregg, she soon recovered. In May, the menstrual functions resumed their activity, and the patient menstruated through the bladder. Her condition was quite tolerable. The urine was retained without difficulty two or three hours while walking about—the uterus acting as a plug above, and blocking up in some measure the escape of the urine.

November 8th, the fistula was again closed with four sutures, and a minute opening (*c*, Fig. 4), discovered there for the first time, was also closed with a single suture. This minute fistula was doubtless formed by the dragging of one of the sutures in the first operation. The treatment of the patient was the same, with one exception, a plan adopted from the result of experience derived from the management of the first case here reported. Instead of giving opiates to restrain the action of the bowels, an enema was administered on the 10th, which, not operating, was followed by a dose of castor-oil. The bowels were freely moved on the 10th, 13th, 14th, 15th, and 16th, without the slightest unfavourable result, the patient being gently inclined to the side, the catheter retained in situ, warm enemata administered, and a bed-pan slipped under the buttocks. During the nine days of confinement her diet consisted of light, nutritious animal broths, &c. The sutures were removed on the 17th, union being complete and perfect. The tone of the bladder was soon restored, and in a few days the patient was about her household duties, entirely and perfectly cured.

On the 26th of December, we received from her husband the astounding intelligence that the woman was *pregnant!* Though almost incredible to us, still the evidence was so positive that we could not doubt the existence of the fact. The husband stated that for some days she had felt the motion of the fœtus, and that on the 25th, while walking about the house, she had felt certain violent movements, which were immediately followed by a recurrence of the leaking. On the 1st of January, while we were preparing to make a visit to the patient to verify the truth of the information we had received, and to determine what would be best to do under the circumstances, we received word that the woman had aborted. On visiting her a few days subsequently, we were informed that she had been suddenly seized with labour-pains, and that the fœtus was born in two hours, having reached apparently the end of the fifth month. The patient had menstruated in May and June, and had probably become pregnant after the latter month, impregnation having taken place through the fistulous opening.

The destruction of the septum was much less than we anticipated, the laceration having occurred lower down than the site of the recent opening, and being of an irregular curved shape (see Fig. 5), one and one-fourth inches in length by three-fourths of an inch in width. This opening was closed January 28th, by six sutures, two transverse, two longitudinal, and two oblique.

Fig. 5.



An enema was directed to be administered on the 30th, and repeated every second day. On Monday, February 4th, the seventh day after the operation, the patient began to menstruate, requiring the removal of the catheter, which was not again introduced, she being able to void the contents of the bladder at will. The sutures were removed on the 6th of February, exactly one year from the date of the first operation, the parts being perfectly sound, union complete, and most satisfactory in every respect. The patient got up immediately and began to attend to her domestic duties. The tone of the bladder was unimpaired, and she retains her urine without any difficulty or uneasiness, feeling in every respect, as she expresses herself, as well as ever.

CASE III. This patient, Mrs. P. M., aged about 20, was confined for the first time about two months previous to the time of my seeing her. The only account she could give of her case was that her labour had been a tedious one, complicated with a prolapse of the funis. She could, however, give no information as to whether instrumental means had been resorted to in effecting delivery. The main difficulty we had to contend against in operating was the extreme nervousness of the patient, the operation being much embarrassed thereby.

The fistule was about half an inch in length, situated an inch below the os uteri, in the median line, its shortest diameter being transverse.

On Tuesday, April 23d last (1861), assisted by Drs. Gregg and Baker, the operation was performed in the following manner: Both edges of the fissure were seized at the same time and approximated by a pair of strong forceps with toothed extremities, and the vaginal septum being well elevated so as to bring the parts on the stretch, the entire edge of the fistule was sliced off with the curved knife at a single sweep. The angles were then more accurately and thoroughly cut out with the curved scissors. A soft sponge was then introduced into the wound and the patient allowed fifteen minutes' rest. Four sutures of silver wire were then introduced transversely and twisted to their positions as in the preceding operations. The ends of the wires were confined together to the thigh by a tape, the catheter introduced, and the same general directions given for the management of the case, as before stated.

The catheter was removed about once in two hours, and the vulva well cleansed. The sutures were removed on Thursday, May 2d inst., union being complete. The line of cicatrization was pencilled with a stick of lunar caustic. The catheter was introduced every two or three hours, but on the second day after the removal of the sutures, the patient discontinued its use, the sphincter vesicæ having recovered its tone. Since then the patient has resumed her usual duties, and is in every respect well.

These cases are presented to the profession as an additional tribute to the already well-earned reputation of Dr. J. Marion Sims, to whose patient investigation and earnest zeal we owe the perfection of an operation, the failure to accomplish which with any degree of certainty was for a long time one of the opprobria of surgery. Through his skill and ingenuity, together with the contemporaneous investigations and experiments of his worthy and illustrious compeer Dr. Bozeman, we are now enabled, with assurance of success, to promise relief to those afflicted with this most serious and distressing lesion.

It may not be out of place here to bring prominently before the profession one or two practical points deduced from the history of the above cases. One of these is the non-necessity of observing a rule, so universally insisted upon by surgeons in these operations, namely, of restraining the action of the bowels during the whole period of confinement, usually nine to ten days. In many instances such a course must be attended with great inconvenience as well as some degree of danger. In the four cases (the other operated for in December, 1859) in which the writer has operated, the attempt to constipate the bowels has always been followed with unpleasant consequences. Another fact deduced from the result in the second case here reported, which, as far as the writer knows, is the most extensive vesico-vaginal fistula yet successfully operated upon, is the complete efficacy of the most simple and uncomplicated plan of operation, the use of the simple twisted silver (or other metallic) wire suture. It is fair to presume that if this operation has succeeded in a case of such extent and with such a great loss of substance, it will answer the purpose in any case.

The object should be to simplify our operative procedures as much as possible. Whatever is unnecessary and superfluous only complicates and delays. In the hands of such an accomplished and skilful surgeon as Dr. Bozeman the button suture doubtless is most successful; but for the large majority of those who may be called upon to treat such cases, the simpler the contrivance, if it answers the purpose, the better adapted it is to their wants.

After Dr. Bozeman, the object of some operators, who have turned their attention to this branch of surgery, seems to have been more to devise something new in the way of apparatus, no matter how complicated it may be and difficult of application, than to effect their purpose with the least difficulty and the most celerity. We think they are taking a step in the wrong direction, burdening the operation with useless incumbrances, and thus deterring many from undertaking what otherwise would, in ordinary cases, be a comparatively simple matter, by making it appear a very intricate and complicated one.

Davenport, May 27, 1861.

Art. VII.—*Spina Bifida, treated by Iodine; Cure by one Injection.* By Daniel Brainard, M. D., Professor of Surgery in Rush Medical College, etc.

November 7th, 1860, a girl three years old was brought to me to be treated for spina bifida. The child was intelligent, healthy, and well formed in every respect excepting the tumour situated over the sacrum. This was eight inches in circumference at the base, about two and a half inches in height, conical, translucent, elastic, and covered with healthy skin excepting a small point at the lower part where it was discoloured like the vestige of a nævus. Below the tumour there was an umbilicated depression like a cicatrix adhering to the sacrum.

Operation.—Nov. 10th, 1860, assisted by Prof. Ephraim, Ingalls and Dr. Edwin Powell, the operation was performed as follows: A small sized hydrocele trocar was carried into the tumour at its base on the right side, and six ounces of fluid drawn off; while this was flowing, pressure was made by an assistant, and as the sac was emptied, the pulp of the thumb was pressed upon and partly into the opening in the spine which it exactly filled, so as to close it as perfectly as possible. Half an ounce of a solution (five grains iodine, fifteen grains iodide potass to the ounce distilled water) at the temperature of the body, was then injected through the canula and after a few seconds allowed to flow out; distilled water at the temperature of the body was thrown in to wash out the iodine, and two ounces of the fluid first drawn from the sac and kept at the same temperature, were re-injected and the canula withdrawn. From movements of the child, some bubbles of air passed into the sac, and as these could not readily be brought out they were left.

During the operation the child was kept under the influence of chloroform, of which it required a very unusual quantity, and, when this was finished, it remained fifteen minutes in a quiet sleep.

The puncture was dressed with a strip of isinglass plaster and a compress supported by a band around the pelvis placed over it.

On awakening, the child made efforts to vomit and seemed to be severely nauseated for half an hour, when it fell into a light sleep. During the afternoon it vomited occasionally, refused food, asked for cold water, and urinated often.

11*th*. Has been restless during the night, probably from being kept lying on the face; pulse and heat of skin natural, puncture at eleven o'clock; twenty-four hours after the operation, found to be leaking; tumour tense; applied more perfect compression over it. During the day child drank freely of toast water, and in the afternoon fell into a free warm perspiration, which lasted two hours.

12*th*. Has slept well, asked for toasted bread twice, and ate it; seems perfectly well.

13*th*. Tumour tense, redness around the puncture; applied cloths dipped in warm water.

15*th*. Puncture leaking; passed a fine needle through the edges, tied a fine thread around it, in form of twisted suture.

17*th*. Tumour tense; tapped it on the left side near the base on sound skin with an exploring trocar, and drew off six ounces of slightly turbid fluid. Continued warm water applications.

19*th*. First puncture leaks slightly; needle withdrawn and compress supported by a truss placed over it.

20*th*. First puncture closed; child in its usual health, tumour flaccid, walls slightly firmer than before the operation. *Translucency quite gone.* Applied an India-rubber band around the pelvis so as to compress the sac.

25*th*. Tumour much diminished; walls firmer. Removed the band and substituted an umbilical truss, the pad of which was placed over the sac.

30*th*. Child in good health; tumour diminishing.

Dec. 3. Tumour but imperfectly fluctuating and evidently filled with semi-solid contents.

From this time to December 31st the truss was kept applied with compresses of fine linen within the centre, so as to press the skin into the opening in the spine. It was taken off and replaced daily, so as to avoid excoriation. The child suffered no pain, was in perfect health, and played about as before the operation.

31*st*. She skin at the centre of the tumour is adherent to the opening in the spine, which is felt to be closed. A little fulness around the base at the upper part alone marks the vestige of the tumour. I advised the continued wearing of the truss unless it should excoriate, and the parents left for home.

Feb. 10. Child has remained well; no tendency to return in the tumour. Truss has been left off for several weeks at a time when the pressure produced restlessness.

The fluid first drawn from this tumour was perfectly limpid, had the peculiar odour of the cerebro-spinal fluid, was very slightly albuminous.

With the microscope, only a few epithelial scales, and a trace of coagulated fibrin, could be detected. That drawn on the seventh day was turbid, and on cooling deposited a sediment composed of coagulated albumen and fibrin, with what appeared to me to be pus-globules here and there. These, if I was not mistaken in their character, must have come from the internal orifice of the puncture, which was still leaking.

Remarks.—This is the seventh case of spina bifida which I have treated by iodine injections. In no case have I seen it produce dangerous symptoms. It is the third unaccompanied by hydrocephalus; all these three have been perfectly and permanently cured—one with thirteen injections, one with two, and the last with one. In the last two, means were taken to prevent the passage of the solution into the spinal canal. In one, the tumour being pediculated, this was easily done; in the other, the means above described were resorted to with satisfactory results. When this can be effected, the solution may be used strong, and washed out so as to render one or two operations sufficient. The object of reinjecting some of the fluid in the case above reported, was to enable a hand around the pelvis to effect some pressure on the cord.

The operation is so delicate that it is not easy in any case to fulfil all the requisite conditions. Thus, in the above case, the walls were so thin at the point of puncture, that it did not close for ten days, constituting a source of danger. Some bubbles of air also passed in, to which too much consequence need not be attached, as no harm resulted; but it would be preferable to avoid such an occurrence.

Applications of collodion for the cure of spina bifida have been recently suggested. When the walls are thick and firm this may be safe, and will be as serviceable as other forms of compression. When the covering is thin, it is dangerous. Dr. James Gow reported, in the *Chicago Medical Journal* for November, 1860, a case where it caused ulceration and rupture. Prof. Gross reports, in the *North American Medico-Chirurgical Review* for November, 1860, a case of this malformation, treated by injection of iodine. "The tumour was thoroughly painted over with collodion." The tumour opened (not at the point of puncture) on the second day, and on the sixth it "burst completely." Although the covering is stated to have been "on the point of bursting" before the operation, it seems probable that the collodion hastened if it did not cause the rupture.

In another case by Prof. Gross (*ib.*), where about ten injections were used in eight weeks, the collodion was kept applied, and the tumour burst, causing death. Concerning this case, there are two points deserving notice:—

1. As there is no reason to suppose that the rupture was caused by the injections, it must be attributed to the collodion.

2. As the tumour was found on dissection to be "about one-third obliterated by coagulable lymph," the inquiry naturally suggests itself, whether one or two injections would not have been sufficient. A certain thickening of the walls has indicated to me that further injections were unnecessary, and the loss of translucency, or the turbid appearance of the fluid withdrawn are indications of a change in the structure and action of the lining membrane, sufficient, with judicious pressure, to effect a cure.

As these cases of Prof. Gross, taken without detail, are calculated to discourage the trial, it may be well to note that, although about ten injections were made so as to pass in some degree into the spinal canal, "the child early suffered from the convulsions after the operations, and they always readily yielded to a dose of castor oil."

I regard both the cases of Prof. Gross as tending to show the safety and efficiency of this method of treatment, as in both plastic lymph was deposited within the sac without any dangerous symptoms attributed to the operation having occurred.

The manner in which collodion acts in producing ulceration is threefold: 1. By vesication; 2. By expelling the blood from the thin walls; 3. By increasing the tension of the walls of the sac, which it does by diminishing its size.

TRANSACTIONS OF SOCIETIES.

ART. VIII.—*Summary of the Transactions of the College of Physicians of Philadelphia.*

1861. *Feb.* 6. *Report on Meteorology and Epidemics for* 1860.—Dr. W. JEWELL read the following report:—

In offering my report for 1860, I must again acknowledge my indebtedness to James A. Kirkpatrick, Esq., Prof. of Civil Engineering in the Philada. High School, for an abstract of the tables of his meteorological observations during the year. (pp. 82–83.) The accuracy of these tables is undoubted, while their usefulness for present and future reference will be admitted.

The following summary of these observations is from his own pen.

The mean temperature of the year (1860) was less than four-tenths of a degree below that of the year 1859, and nearly two-tenths of a degree below the average for the last nine years.

The maximum temperature (95½°) occurred on the 20th of July. The minimum temperature, one degree above zero, was on the 2d of February.

The warmest day of the year was the 20th of July, when the mean temperature was 87.7°. The coldest day was the 2d of February, the mean for that day being 9.2 degrees.

Of the seasons, the spring was one degree warmer, and the summer one degree colder than the average for nine years, while the winter and autumn were very close to the average.

Of the months, the greatest variation from the average was in December, which was nearly 3° colder than usual, and was the coldest December since 1856.

The maximum pressure of the atmosphere (29.418 inches), occurred on the 14th of December; and the minimum pressure (29.099), on the 18th of February. The average pressure was very nearly the same as that for 1859. It may be interesting to notice that the average pressure, as indicated by the mean of the three observations, is very nearly the same as the mean of the observations at 9 P. M., the difference for the whole ten years being only .002 of an inch.

It is becoming also to inform the college that, in consequence of the inauguration of the new law for the registration of births, marriages, and deaths, which went into operation, under the supervision of the Board of Health, on the 1st of July, 1860, I have rearranged the tables, that they might conform to those published by that Board, and have added tables of the births and marriages registered since the law was enforced.

I have also changed the order of grouping the diseases, which order has been faithfully preserved since 1850. This change occurs at a suitable time, as the tables already published by the college embrace a statistical decade from 1850 to 1859, and is well adapted for calculations as to the vital statistics of our city.

No apology need be offered for making this alteration. As a member of the committee "on a uniform plan of registration reports of births, marriages, and deaths," appointed by the American Medical Association, and whose report was adopted by the Association at its meeting in Louisville, Ky., May, 1859, and subscribing cordially to the suggestions therein made, I could do no less, when an opportunity offered, than to follow out the recommendation of the committee for the forms of tables—both as to the classification and nomenclature of the causes of death—which, with but few alterations, are the same as were adopted by the Association in 1847. This favourable opportunity has occurred, and I have embraced it, in framing this report. Another feature herein embodied, and one that modifies the report in several respects, is the reference to the statistics of our total population, as well as of the population of the several wards. This modification has been effected through the operation of the eighth U. S. Census, which was taken during the month of June, 1860.

From the figures, as given by the marshal of this district, I find that he makes our population 568,034, an increase over the population for the census of 1850 of 159,272, or 39 per cent. Should this statement be correct, it gives us an average growth of about 3 per cent. per annum. But the question arises, have authentic returns been received? When we take into consideration, the usual growth of large cities—which will exceed 5 per cent.—the length of time occupied in obtaining the returns—a month—the season of the year—June—when a large portion of our population had left the city for the summer, and the number of houses shut up, where no answers could be obtained, the natural inference will be, that justice has not been done to the vital statistics of Philadelphia. This opinion is by no means peculiar to myself. There are others who have investigated the subject, and are satisfied that the total of population as given in the marshal's returns, is below the actual number, and at variance with facts. But such is the census return, and it goes abroad as correct. During the present decade, therefore, we shall lose the advantage we would otherwise gain from a true record of the number of our inhabitants; unless Councils should determine to have a census taken, in order to place the city, in point of population, where she rightfully belongs, as has been properly suggested by the mayor in his last message to that body.

The introduction of the tables of births and marriages, for the last six months of 1860—if not of any practical application at the present time, seems to be proper, in order to preserve an entire uniformity with our new system of registration, and thus establish a plan after which our vital statistics and our sanitary inquiries may be framed in the future.

From the annual report of the Board of Health I learn that, thus far the law for the registration of births, marriages, and deaths which this college, in connection with the Philadelphia County Medical Society, was instrumental in having enacted, "is popular, and its present success not only affords an evidence of the appreciation in which it is held by the most of those interested, but gives encouragement for its future progress and permanency."

"The registration of the names of all persons who are required to make returns under this law, has been, with a few exceptions, both cheerfully and faithfully complied with by the parties themselves. The necessary register has been alphabetically arranged under three distinct heads, and contains at this time the autographs of 1302 clergymen, physicians, &c., with their respective residences in our city, as follows:—

Clergymen	370
Clerks of the records of religious societies	4
Physicians	701
Practitioners (female) of midwifery	51
Mayor	1
Aldermen	36
Undertakers	79
Superintendents of burial grounds	60
	1302

"Since the law went into effect, up to the 31st of December, 1860, a period of six months, there have been returned and registered 8434 births, 2310 marriages, and 6342 deaths.

"It would be unreasonable to suppose that the statistical contributions, as detailed in these registers, could at this incipient stage of the record be made available, or answer any valuable purpose in reference to the vital statistics of our city. All that is contemplated in this first report, is to furnish an abstract of the returns in tabular form, which will serve as a basis of reliable data for the preparation of future reports. It is only by the accumulation of facts connected with vital and mortuary statistics, during a succession of years, carefully and intelligently collated, and accurately aggregated and compared, that the laws governing human existence can be determined.

"Each new annual report will be entitled to additional consideration from its increased value, arising from the useful information it will furnish to those who shall hereafter engage in the investigation of the science of vital statistics. We trust, therefore, that the inauguration of this new and important system is the beginning of a reform in the science of life in our city, and that this limited contribution may be followed annually hereafter by more extended, more valuable, and more interesting reports."

I have also availed myself of several of the tables, for this report, as compiled by the registration clerks of the health office, because they were prepared according to the instructions of your reporter, and are in conformity with his own views of tabulating and collating the records of births, marriages, and deaths.

BIRTHS.—The number of births returned and registered for the six months of the year, under the new law, will be found in Table I. They amount to 8,434. Of these, 4,426 were males and 4,008 females. An excess of male births equal to 10.40 per cent.

In the same table will be found the births that occurred in each of the six months; those in each ward of the city; the population of each ward according to the census returns, together with the percentage of births to population in each ward.

From this we learn that the Nineteenth Ward furnished the highest number of births, viz., 623, and the Eighth Ward the lowest number, viz., 184.

August seems to have been the most prolific month in births, giving 1,575, while December gave but 1,247.

According to the population of the wards, the highest percentage of births must be awarded to the Seventeenth, viz., 456, or 1.95 per cent., and the lowest to the Eighth, viz., 184, or 0.66 per cent., while the ratio of births to population in each ward is in favour of the Seventeenth, which yielded 1 in every 51.

The registration of births of coloured children, amounting to 148—82 males and 66 females—can hardly be relied upon for its correctness, as I have reason to believe that the colour in every instance has not been designated.

Fifty-seven cases of twin births were registered, and there was one instance of triplets.

The month of August yielded 15 cases of twin births, December 11, July 10, November 9, September 7, and October 5.

As an evidence of the estimation in which the registration law is held by those who are required to make returns of births, there were only 155, or less than 2 per cent. returned without the location being designated.

If the returns of births made for the last six months are to be considered as the half of those that have occurred for the year, they would give a total of 16,868, which is equivalent to 1 in every 35 of our population, allowing that our population is equal to 600,000 instead of 568,034, as given by the census. These returns are a more favourable indication of the general hygienic state of the city than has ever before been shown by our birth statistics.

The stillborn children for the six months numbered 347—208 males and 139 females—an excess of 69 male births, equal to 50 per cent. The stillborn are included in the general table of births, according to the recommendation of the American Medical Association. They were in the proportion to the living births as 1 in every 24, or 4 per cent.

MARRIAGES.—Since July 1st, the number of marriages registered under the new law amounts to 2,310. See Table II.[1]

Of the number registered, 2,371 of the parties were Americans by birth, and 1,961 were born in other countries. The birthplaces of 288 were not given.

Of the married couples, 1,138 of the grooms, or 49 per cent., were born in the United States; 1,025, or 44 per cent., were of foreign birth, and of 147, or 6 per cent., the birthplaces were omitted.

Of the brides, 1,233, or 53 per cent., were native born; 936, or 40 per cent., were of foreign birth, and 141, or 6 per cent., were registered as unknown.

The instances in which American men married American women were 999, or 43 per cent.; while those cases where both parties were of foreign birth amounted to 801, or 34 per cent. of the whole.

Only 125, or 5 per cent. of American men married women of foreign birth, while 220, or 9 per cent. of American women were united to foreigners.

Table III. gives the ages of the parties married. Of the grooms, only 10 were under 20 years of age; 834, or 36 per cent., were between 20 and 25 years; 635, or 27.35 per cent., between 25 and 30 years; 433, or 18 per cent., between 30 and 40 years; and beyond that period of life there were 154, while of 244 grooms the age has been omitted.

Of the brides, 464, or 20 per cent., were under 20 years of age; 948, or 41 per cent., between 20 and 25 years; 369, or 16 per cent., between 25 and 30 years; 217 between 30 and 40 years; beyond that age there were only 60 registered according to age, while in 252 of the marriages the ages of the brides were not given.

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[1] This, however, cannot be considered a correct estimate of the marriages in our city. That it falls short of the true number I have not a doubt; at the same time it must be received as a fair beginning for the inauguration of a law which, judging from the returns, has but few friends among the clergy.

The greatest inequality of ages was presented in the marriage of a groom between 60 and 70 to a bride between 20 and 25 years of age.

There were 8 grooms registered under 20 years of age. One groom was 18 and his bride 17 years of age.

The popular age for marriage, according to this table, is between 20 and 25 years. The second favourite age, with females, is under 20; but with males, between 25 and 30 years.

MORTALITY OF PHILADELPHIA.—Herewith will be found a general summary of deaths for the year. It is so divided or classified as to show at a glance the white and coloured, the male and female, the adults and minors, those deaths from actual disease, and those from accidental or other external causes.

General Summary of Deaths.

Total number of deaths reported for 1860		11,568
White	10,949	
Coloured	619	
Total		11,568
Males	6,109	
Females	5,459	
Total		11,568
Male minors or children	3,594	
Female " "	3,125	
Total minors		6,719
Male adults	2,515	
Female adults	2,334	
Total adults		4,849
Deaths from registered diseases	10,055	
Deaths from stillborn	719	
Deaths from old age	213	
Deaths from unknown external and accidental causes	581	
Annual total of deaths from all causes		11,568

According to the above summary, the deaths for the year, from Dec. 31, 1859, to Dec. 29, 1860, amount to 11,568.

This mortality shows an increase of 1,826, or 18.74 per cent. over that for 1859.

This augmentation in our mortality may be ascribed principally to the increased force and diffusion of certain diseases; while the improved system of collecting the deaths under the registration law, which has been in operation since the first of July, has no doubt furnished us with more correct returns.

It is well understood that during 1859 our city was favoured with a remarkable degree of health. The deaths were 9 per cent. below those of 1858, and 12.19 per cent. below the average of deaths for the previous four years.

Nor did it create any surprise that the correctness of the returns for that year as presented in my report to the College, should be questioned by statisticians abroad. And notwithstanding there may be causes that have been developed since the new law of registration went into operation to account in some measure for the limited returns of deaths in 1859, still, when I consider that the mortality was 12 per cent. below that of the average of deaths for the preceding four years, which deaths were returned under the same law, and when I know, from a comparison of the records for 1859 and 1860 that there has been an increased force and diffusion of certain diseases during the latter year, I am not prepared to ascribe either the limited number of deaths in 1859 altogether to defective returns, or the augmentation of deaths in 1860 altogether to the improved system under the new law.

An examination of the returns for the first six months of 1860, which were made under the old law, shows an increase of 7.55 per cent. over those for the same period in 1859; while the deaths in this latter year were 9 per cent. less than those in 1858; and when I discover that the deaths from diphtheria and scarlet fever in the last six months of 1860 have increased 343 per cent. over those for the last six months of 1859, I cannot be forced to the conclusion that the augmentation of deaths in 1860 is attributable to the defective returns under the old law.

If I have been led into any error in my calculations for 1859, it must be ascribed to the circumstance of overrating the population, an error into which statisticians in large cities have been sometimes led.

Of the total of deaths 6,109 were males and 5,459 were females; an excess of male deaths equivalent to 12 per cent.

The mortality among minors, or those under twenty, was 6,719, while that of adults was only 4,849; an excess of deaths equal to 38.35 per cent. of the former over the latter.

The mortality of children under five years of age as compared with the total mortality was 5,704, or 49.30 per cent. This heavy and frightful mortality during infancy is no more peculiar to our own than to other large cities. Viewed in a sanitary aspect, there is much in this pressure on infant life worthy our consideration.

It is scarcely a matter to be questioned, because acknowledged by all who have investigated the subject, that one of the principal causes for this enormous death-rate of our infant population is the unhealthy condition of the atmosphere we breathe. Nor is it less obvious that the catalogue of diseases to which the deaths among children are assigned, embraces chiefly that class called preventable, or those depending upon local and removable causes.

In Table IV. will be found the record of deaths from Dec. 31, 1859, to June 30, 1860. This period terminated the existence of the system of collecting and recording the deaths and births under the old health law of 1818. It tabulates the number and causes of death, with the sexes, and periods of life when they occurred, for the first six months of the year.

Table V. gives the deaths, under the new law, for the past six months, with the sexes, the adults and minors, as also the several periods of life when the deaths occurred, and the total number deceased for each term designated.

Table VI. furnishes the wards, with the number of deaths in each ward from the several diseases named, together with the deaths from the Almshouse, the country, and those among the people of colour, with the nativity of the deceased. It will be observed that 4,888, or 77 per cent., of those who died were born in the United States, those of foreign birth amounted to 1,096, or 17.28 per cent., and of unknown nativity there were registered 358, or 5 per cent. This table also gives the population of each ward, together with the ratio of deaths to population, and percentage of deaths in each to the total mortality for six months.

The heaviest mortality according to population was in the Fourth Ward, equal to 1 in every 61; the next highest was in the Second Ward, 1 in 69. In the Seventeenth Ward the rate of deaths stood 1 in 76; in the First Ward 1 in 83; in the Third Ward 1 in 84; and in the Seventh and Nineteenth Wards 1 in 87.

In most of these wards, where the mortality has been the heaviest, an explanation for the high death-rate will be found in the character of a part of the population, the manner in which they live in crowded apartments in narrow streets, blind courts and alleys, amid dampness and filth, without sufficient light and ventilation, badly fed and clothed, and subjected to other defective sanitary arrangements. Whereas, in other wards, where the population was proportionably large, but less crowded, and enjoying more of the comforts and conveniences of life, with an adequate supply of light, and sufficient ventilation, the death-rate was comparatively low. For instance, in the Thirteenth Ward, where the population rated 20,132, there were only 123 deaths, in the ratio of 1 death to every 163, or 2 per cent. of deaths to the total mortality; while in the Fourth Ward, already alluded to, where the population was but 23,633, there were 385 deaths, or 1 to every 61 of its inhabitants, and equal to 6 per cent. of the total mortality! Such is the contrast, in the mortality of our city for the last six months of 1860, between a favourable and unfavourable sanitary district.

Similar comparisons may be instituted between the healthy and unhealthy states of other wards by a reference to the table.

Table VII., Class I. ZYMOTIC OR EPIDEMIC DISEASES.—Adopting the classification of diseases as recommended by the American Medical Association, I now refer to those deaths which come under that division called Zymotic, and which have an epidemic, endemic, or contagious character.

By a careful investigation of the death-roll, it will be found that this class of diseases, which depend upon the altered condition of the atmosphere, and upon local causes, either for their existence or their fatality, are among the most active in swelling our bills of mortality. The total number of deaths from this class during the year amount to 2,275, or 22.62 per cent. of the deaths registered from diseases, or 1 in every 5 of the total mortality. Class I. holds, therefore, an important place in the mortality record of our city, furnishing a heavy percentage of the deaths; while at the same time it is capable of demonstration that this form of disease is fostered by predisposing causes which in a great measure are capable of being removed by sanitary police regulations.

In this class will be found those diseases which press heavily on infant life—and they are mostly the result of causes that are local and removable, of an endemic and avoidable origin. The extent of mortality among minors, in this class, over adults, is equal to 362.4 per cent., or more than 4 of the former to 1 of the latter. An improvement in the sanitary condition of our city will diminish the annual death-rate from zymotic diseases. In evidence of the correctness of this opinion, an examination of the record will show that the highest mortality from such diseases has been in our densely populated wards, and those which are not favoured with advantages that have a direct tendency to mitigate the destructive influence of the cause or causes of epidemic and endemic diseases.

Cholera Infantum, a disease peculiar to cities, and confined to the summer months, destroyed 514 children. The heaviest mortality since the operation of the registration law, July 1st, was in the Nineteenth, Seventh, Fourth, Third, Twentieth, and Seventeenth Wards, in the order in which they are named. It is well known that these wards are overcrowded and contain localities which are badly ventilated, maintain a squalid population, and are peculiarly adapted to invite and determine the onset of disease. Nevertheless, cholera infantum is on the decline in our city; and, while I admit that the deaths from it have increased 26 per cent. over those for 1859, still if the average for the last four years be taken, it will furnish the evidence that I am correct. Nor can this mitigation of a fatal disease among children be attributed so much to an improved condition of the localities where it has been too often a familiar visitant, as to those advantages alluded to in my last year's report, which are afforded the population of our crowded courts and narrow alleys for securing a change of air by means of the numerous city railroad conveyances that safely glide in every direction through our streets, at all hours of the day.

In this connection I embrace the opportunity of expressing my thanks, as a sanitarian, to our city authorities for the liberal measures they have devised to improve the several grounds at Fairmount, more particularly those of Lemon Hill and Sedgely Park. As a public provision for the security of the health, as well as for the enjoyment of the masses, these pleasure grounds cannot be too highly prized. With the facilities for reaching them from all points of the city, that portion of our population whose circumstances restrict them to a residence in crowded and pent-up localities, where the air does not circulate in its purity, have herewith afforded them a healthful resort. Here wornout wives and enfeebled children can enjoy a pure atmosphere during summer's heat, and pass away hours watching the romantic Schuylkill, as its silvery stream winds along the western slope of the park, or strolling through shaded groves and walks adorned with luxuriant foliage. The establishment of these parks for the people is a great sanitary movement on the part of the authorities, but it is not sufficiently appreciated by the community. What by many is considered to be a lavish waste of public funds in appropriations for the embellishment of these great lungs to the city, is, if rightly viewed, a public saving—a gigantic sanitary protection against the inroads of pauperism—a check upon sickness among the working classes; it becomes indirectly a benevolent provision for the security of the public health, and thus adds to the vital prosperity of our population.

In my report for 1859, I intimated the existence of indications that before a great while we might have to combat with diphtheria—a prognostication that has to a large extent been realized during the year 1860, the deaths having amounted to 307. This mortality, as shown by the record, has observed a gradual increase for each successive quarter, as follows: 1st quarter, the deaths were 36; the 2d, 57; the 3d, 75, and the 4th, 139. During the last six months of the year, the heaviest mortality occurred in the first four wards of the city, amounting to 49. The 18th, 19th, and 20th wards furnished 43 deaths, the 14th and 15th wards added 28, while the 7th ward gave 11 deaths. These wards are densely populated, and in all of them may be found locations peculiarly adapted to the propagation of epidemic diseases, from their low hygienic condition. At the same time, it is but proper to state that cases of diphtheria, and many of them resulting in death, have been quite prevalent in the more salubrious, elevated, and well ventilated sections of the 14th and 15th wards, where it would be less likely to spread through infection or contagion.

Of the deaths recorded for the whole year from diphtheria, 142 were males, and 165 females, an excess of 16.33 per cent. of females. Among adults, there were only 12 deaths, the remainder, 295, were under twenty; of these, 37 were under 1 year; 56 between 1 and 2 years; 116 between 2 and 5 years; 68 between 5 and 10 years, and 18 between 10 and 20 years. The heaviest mortality was in children between 2 and 5 years of age, equal to 164.6 per cent. of the deaths from diphtheria.

Both the character and treatment of diphtheria have been subjected to a wide difference of opinion in medical circles during the past few years. The manner of its propagation—whether by direct contagion, or infection through an aerial poison; whether it can be conveyed by the clothes of an individual visiting a diphtheritic patient; whether it is epidemic, endemic, or sporadic; whether it is a new or old disease; whether it is scarlet fever or croup, or whether a disease of a specific origin, or of the blood, or one of local inflammation—has been frequently discussed. Some view it as scarlet fever, while others look upon it as croup.

That it bears a close resemblance to both of these diseases, cannot be denied; but I am far from believing that diphtheria, as it appeared in our city during 1860, is identical with either the one or the other. When I have witnessed fatal cases of the disease without the croupal cough, or laryngeal inflammation; when I have seen a child die of diphtheria that, one year previously, had scarlet fever in its most malignant form; and when I have seen both scarlet fever and diphtheria side by side in two children of the same family, presenting no identity, except in their fatal termination in a few days, exhibiting in the one case the laryngeal diphtherite, and in the other the true characteristics of congested scarlet fever, of a most malignant type, I am sure not to err, if I decide that they are not the same disease.

I am aware of the close resemblance between diphtheria and scarlet fever, and I am sensible, also, that in expressing an opinion as to the specific nature of the former to that of the latter, I am running a tilt against the judgment of high authority. That the close analogy of the two diseases, and their occasional complications, may lead to error in diagnosis, I can readily admit, and believe that one has often been treated for the other; and where the two diseases prevail simultaneously—as they have done during the year 1860—much confusion may arise, in designating their true character, especially where many of the symptoms differ but slightly. Nevertheless, there is a distinct line of demarcation by which the identity of diphtheria can be recognized.

I have at the present time a grave case of diphtheria under treatment. The fauces, the pituitary membrane, the pharynx, and œsophagus, were all affected with inflammation, as far as could be seen with the eye, followed by an exudation of a grayish-white lymph, accompanied with epistaxis, and an asthenic condition of the system. It is now in the third week, and although the patient is slowly recovering, there is extreme prostration of the vital powers, amounting almost to paralysis, particularly of the organs of deglutition, which, by some authors, is looked upon as a pathognomonic symptom of diphtheria; yet in this family, where there are seven children, only two of whom have had scarlatina, not a case, up to this date, has occurred of either disease, although the surrounding circumstances would lead to the inference that if it were scarlatina, or even a contagious disease, one or more of the family would have been attacked.

I have no belief, therefore, in its contagious character. As an epidemic, the disease may be communicated through an atmospherical poison. Nor am I willing to convey the idea, that in my practice, I should act as if it were contagious. Passing through numerous cases of the disease during the year, I have not observed a single instance wherein a materies morbi was developed, that reproduced itself.

If diphtheria does bear an analogy to croup in the fact of an adventitious membranous deposit upon a mucous surface, it is well authenticated that this formation commences in the fauces, and may extend to the larynx, while that of croup invariably shows itself, and is confined to the larynx and trachea. Diphtheritic croupal symptoms are secondary, or accidental, while, according to Dr. Pepper, laryngeal or true croup is a primary affection. I have no question as to the distinct character of the two diseases.

The treatment of diphtheria has been the subject of much diversity of opinion. It is, however, almost unanimously conceded that both a local stimulative and a sustaining treatment is required from the very commencement of the attack, especially in those forms of the disease that have appeared in our city, where an asthenic condition was a marked characteristic.

Scarlet fever has been very prevalent during the year. The deaths amount to 591; this is an increase over those for 1859 of 359, or 154 per cent., and furnishes a considerable item for the increase of the year's mortality, especially during the last six months, over that of 1859. Since the 1st of July, the first four wards, the 7th and 19th, have furnished 55 per cent. of the deaths for the six months. The character of the population, in many parts of these wards, their crowded and defective sanitary condition, to which I have already alluded, will explain the wide-spread prevalence of the disease, and its fatality in those sections of the city.

Smallpox has been on the increase during the year; 57 deaths have been recorded. Of these, 43 were in the last quarter. Nearly all of them, that is, 50 to 7, were in children. 15 of these deaths occurred in the 17th ward; 5 in the 1st, and 6 in the 4th ward; the remainder were scattered over nine of the remaining wards. The disease has been quite prevalent in the 17th ward, where it first made its appearance.

It is a fortunate circumstance that the new ordinance for public vaccination has been in operation during the last six months, in which period 3032 children have been reported as successfully vaccinated. Hundreds of these children would otherwise have met with an untimely death, especially in the 17th ward, where 558 were vaccinated. Nor is it presumptuous to say that, to the neglect of the proper administration of this prophylactic, both on the part of the public authorities for a number of years, and of those parents who refuse to have their children vaccinated, must be attributed the amount of smallpox prevailing in our city at this time. On this subject, I cannot do better than to repeat the views expressed by me in another place, on the gratifying improvement in the system of public vaccination. Believing it to be only one step forward, I have remarked—and every intelligent medical man will surely indorse the sentiment—that "a still higher standard, embracing more adequate provision, is demanded, before a perfect report of the successful state of vaccination in our city can be exhibited. The ordinance now in force is purely benevolent in character, and strictly voluntary in its import. It offers gratuitous vaccination to every individual, and provides an easy method to secure the gift. Unfortunately, however, what with apathy and indifference with some, and prejudice on the part of others, this inestimable sanitary blessing is too often refused, to render it an entire security against the introduction of smallpox.

"What we require, is a compulsory system, under legal enactment, imposing a penalty for disobedience to its provisions, requiring every child born, or brought into the city, to be vaccinated, and making it an imperative obligation that satisfactory evidence of vaccination shall be given as a prerequisite for admission of children into our public schools. This law, in order to operate effectually, should apply to our entire State."

The deaths from enteric or typhoid fever were 213, and they have fallen off 20 per cent. from those of 1859. The miasmatic fevers recorded are so limited in number as not to require any special notice, further than the remark that, for the last few years typhoid fever, from its prevalence, seems to have become the ordinary endemic of the city instead of miasmatic fevers.

Measles, among the exanthemata, has fallen off 73 per cent., only 15 deaths having been recorded.

Dysentery furnishes 178 deaths; it has increased 38 per cent. over those for 1859.

Four deaths from cholera, and 24 from cholera morbus are recorded. The four deaths from cholera were in the third quarter; three of them occurred in the Seventh, Tenth, and Nineteenth Wards.

A single death is registered Typhus Icterodes or Yellow Fever. This case was in the month of September, in the person of a German labourer, about 40 years of age, residing in a German boarding-house on Front near Coates Street. He was employed in unlading rafts at Green Street wharf, and had not been absent from his work the whole season. Throughout the entire week he laboured in the docks during all stages of the tides, and the hottest hours of the day, subjected to wet feet, and exposed at low tide to the offensive and noxious exhalations emanating from the mud and filth of these unhealthy localities. The case occurred under circumstances that forbid the possibility of referring it to a foreign origin. It was a sporadic instance, from a local cause, terminating fatally on the 8th day from the attack. No other case occurred in the neighbourhood. Of its being genuine yellow fever not a doubt was expressed by any one who saw it, and the post-mortem revelations confirmed the diagnosis.

Table VII., Class 2. GENERAL OR UNCERTAIN SEAT.—The deaths from diseases of this class, or those whose seat is of variable, uncertain, or doubtful location, amount to 1656. Debility, which is only a condition of the system the result of disease, having no definite meaning, and should seldom if ever be applied as the cause of death, furnished 538 of the number; while marasmus, otherwise atrophy, and having a very general meaning in death certificates, gave 478—making up 1016, or 61.3 per cent. of the deaths in this class.

Table VII., Class 3. DISEASES OF THE NERVOUS SYSTEM.—They number 1,966; of these, 980 were in the first six months, under the old law, and 986 in the last six months, under the new law. They constitute 19.5 per cent. of all the deaths from registered diseases.

1,240, or 63 per cent. of the deaths in this class, were in children under 10 years of age; of these, 513 are recorded under convulsions, and 266 from inflammation of the brain.

Apoplexy and palsy, two diseases which almost invariably are related as cause and effect, produced 273 deaths; the former 143 and the latter 130.

The increase over those for 1859 is 41 per cent. 157 of the deaths were recorded as disease of the brain; but what particular disease, whether epilepsy, dropsy, inflammation, or mania, is not given.

22 deaths are reported from epilepsy—13 males and 9 females. Contrary to some authorities, the excess is with the males.

Table VII., Class 4. DISEASES OF THE ORGANS OF RESPIRATION.—The deaths under this head foot up 2,975—a higher number by 20 per cent. than the deaths from zymotic diseases.

The deaths from consumption alone amount to 1,622, or 55.6 per cent. of the whole class. For the first six months, under the old law, the deaths from diseases of the organs of respiration exceeded those for the last half of the year, under the registration law, by 337, or 25 per cent. The excess of deaths among males from this class was 89—equal to 6 per cent.

The deaths from inflammation of the lungs were 502. In the two last quarters of the year, under the new law, they amounted to 191. Of these deaths 81 were in the first seven wards of the city. The Second Ward yielded 21 deaths, the Seventh 17, and the Fourth 16. These wards are more unfavourably arranged and populated for the security of health than any other wards in our city.

The deaths from consumption, viz., 1,622, are nearly 8 per cent. above those for 1859, and a fraction below those for 1857 and 1858.

Of the sexes, the excess of deaths is on the side of females—say 6 per cent. As usual, this disease is the cause of a heavy amount of our mortality, constituting 16 per cent. of all the deaths from registered diseases. To the population, according to the last census, they are as 1 to every 350, or 2.85 in each thousand.

The decade of life between 20 and 30 contributed the highest number of deaths, viz., 538, or 33 per cent. The heaviest monthly mortality for the year appears to have been in February, 176; while November gave the least, viz., 106. The previous year November rated the highest.

Of those deaths registered since July 1st, viz., 792, 419, or 53 per cent., were native born, and 285, or 36 per cent., were of foreign birth. Of the remaining number the nativity was not given.

Of the wards during the above period, the Seventh, a densely populated ward, contributed the heaviest mortality, viz., 48; the Second and the Nineteenth each 45; the First Ward 39, and the Fifth 37; the Twenty-first, a rural ward, gave only 14 deaths; the Twelfth furnished 15; the Eleventh and Thirteenth each 16. These three wards contain a medium population, while the Thirteenth rates the healthiest in the built-up portions of the city, and is equal in salubrity, according to the register for the last six months, to the Twenty-first or rural ward.

As alluded to in my former reports, croup is steadily on the increase. During the year 354 deaths have been recorded from this enemy to childhood—an increase of 42, or 13 per cent. over those for 1859. It furnished 16.60 per cent. of the diseases of the organs of respiration. The highest number occurred in the first quarter, embracing the colder months, amounting to 127. The lowest number was in the third quarter, viz., 46.

Table VII., Class 5. ORGANS OF CIRCULATION.—The diseases belonging to this class contribute 350 deaths to the annual mortality—166 males and 184 females.

Under the general term Disease of the Heart there are 287 deaths registered, making 79 per cent. of the total. Of these 135 were males and 152 females. The remaining number, 63, specify the particular name of the cardiac affection, from which death occurred.

Table VII., Class 6. ORGANS OF DIGESTION.—The deaths from the organs of nutrition amount to 582, or 5 per cent. of the mortality for the year—310 males and 272 females. The highest number of deaths are returned in the third quarter, viz., 209. The first quarter gave only 100 deaths. The most prominent disease in the catalogue is inflammation of the stomach and bowels, which returns 279 of the deaths. Inflammation of the liver caused 73 deaths.

Table VII., Class 7. DISEASES OF THE URINARY ORGANS.—This class of diseases caused 80 deaths in the year; of which 50 were males and 30 females. 43 of these deaths were under the general term Disease of Kidneys.

Table VII., Class 8. ORGANS OF GENERATION.—The diseases belonging to the generative system claim to have given 112. All of them except 3 were among adult women. Puerperal fever contributed 47—nearly one-half the deaths. The first quarter of the year gave 22, and the second 13 deaths. During the last six months there were only 12 deaths. Cancer of the uterus supplied 41 deaths—less by 11 than those for 1859.

Table VII., Class 9. ORGANS OF LOCOMOTION.—This class returned 55 deaths. Of these 22 were from rheumatism, and 26 from disease of the spine.

Table VII., Class 10. The DISEASES OF THE INTEGUMENTARY SYSTEM gave only 2 deaths during the year—1 from eczema and 1 from elephantiasis.

Table VII., Class 11. OLD AGE foots up 213 deaths, 73 males and 140 females. As in all vital statistics, the excess of longevity is on the side of females. In this instance 91 per cent. were females. 19 of the deaths were between 90 and 100 years of age, and 4 were over 100 years.

Under this head, "Old Age," is to be found a convenient hiding-place for the difficulty ascribed by some in securing a true diagnosis of the diseases of aged people. The term is entirely without meaning, and for all practical or statistical purposes would answer as well if incorporated under the heading "Unknown," Class 13, which gives 134 deaths, and is another convenient term employed in too many instances, as in the case of "Old Age," to save the trouble of a careful investigation in order to ascertain the true cause of death.

Table VII., Class 12. EXTERNAL CAUSES.—The deaths from external, accidental, or violent causes always make up a considerable percentage of the annual mortality. For 1860 they amount to 447, or 4 per cent. of the deaths from all causes.

The great disparity of deaths in this class between the sexes has not escaped observation. Those under consideration show an excess of male deaths equal to 160 per cent. The male deaths were 323; while those in females were but 124. This inequality may be ascribed to the difference in occupation with the sexes, and therefore men are far more exposed to danger than women.

The stillborn (Class 14) children for the entire year, as registered, amount to 719—an increase of 61, or 9 per cent. over those for 1859. This increase will be found in the first six months of the year, rather than in the last semi-annual period under the new law. They constitute 6 per cent. of the annual mortality.

General Abstract of Meteorological Observations, made at Philadelphia, Pa., during the year 1860.

By JAMES A. KIRKPATRICK, A. M., Prof. of Civil Engineering in the Philadelphia High School.

(Barometer fifty feet above high water in the Delaware River.)

1860.	THERMOMETER.									BAROMETER REDUCED TO 32° F. But not corrected for altitude.							
							RANGE.									RANGE.	
MONTHS.	7 A. M.	2 P. M.	9 P. M.	Mean.	Max.	Min.	Monthly.	Mean daily.	Mean of daily oscillations.	7 A. M.	2 P. M.	9 P. M.	Mean.	Max.	Min.	Monthly.	Mean daily.
	°	°	°	°	°	°	°	°	°	inches.	inches.	inches.	inches.	inches.	inches.	inches.	Inches.
January . . .	28.89	38.37	32.97	33.41	58	3½	54½	6.5	14.8	29.970	29.915	29.938	29.941	30.399	29.593	.806	.159
February . . .	27.24	38.07	31.69	32.33	70	1	69	8.8	17 8	29.970	29.885	29.918	29.924	30.358	29.099	1.259	.209
March	38.15	52.34	43.71	44.73	73	25	48	5.4	18.3	29.829	29.757	29.795	29.794	30.224	29.499	.725	.133
April	43.96	56.56	47.92	49.48	81	29	52	7.4	18.9	29.849	29.794	29.830	29.824	30.303	29.319	.984	.166
May	59.66	71.03	61.57	64.09	90	44	46	5.2	17.2	29.828	29.787	29.815	29.810	30.050	29.479	.571	.100
June	67.70	78.38	69.05	71.71	93	52	41	4.2	18.9	29.757	29.719	29.745	29.740	30.123	29.243	.880	.088
July	72.50	83.89	74.31	76.91	95½	57	38½	5.0	19.8	29.811	29.774	29.787	29.791	29.979	29.495	.484	.112
August	70.13	82.87	73.29	75.43	95	55	40	3.8	18.8	29.848	29.813	29.834	29.832	30.026	29.632	.394	.090
September . . .	60.28	73.17	64.02	65.82	92	42	50	5.2	18.2	30.003	29.965	29.998	29.989	30.313	29.597	.716	.148
October	51.58	63 29	55.61	56.83	79	36	43	5.8	16.1	29.963	29.906	29.938	29.936	30.275	29.312	.963	.119
November . . .	43.30	50.53	45.33	46.39	80	16	64	5.5	14.4	29.821	29.773	29.792	29.795	30.305	29.248	1.057	.197
December . . .	29.32	35.65	31.82	32.26	50	13½	36½	5.0	12.2	29.937	29.911	29.958	29.936	30.418	29.285	1 133	.196
Annual means .	49.39	60.35	52.61	54.12	95½	1	94½	5.6	17.1	29.882	29.833	29.862	29.859	30.418	29.099	1.319	.143
Winter	28.93	37.64	32.18	32.91	71	1	70	7.9	15.6	29.960	29.902	29.929	29.930	30.399	29.099	1.300	.189
Spring	47.26	59.98	51.07	52 77	90	25	65	6.0	18.1	29.835	29.779	29.813	29.809	30.303	29.319	.984	.133
Summer	70.11	81.71	72.23	74.68	95½	52	43½	4.3	19.2	29.805	29.769	29.789	29.788	30.123	29.243	.880	.097
Autumn	51.72	62.33	54.99	56.35	92	16	76	5.5	16.2	29.929	29.881	29.909	29.906	30.313	29.248	1.065	.153
For eight years .	49.69	59.98	53.19	54.29	100½	—5½	106	5.6	15.0	29.893	29.854	29.877	29.875	30.704	28.884	1.820	.154

Meteorological Observations—Continued.

1860.	RELATIVE HUMIDITY.						FORCE OF VAPOUR.								WINDS.	CLOUDS. Tenths of sky covered.				DEW-POINT.					
MONTHS.	7 A. M.	2 P. M.	9 P. M.	Mean.	Max.	Min.	7 A. M.	2 P. M.	9 P. M.	Mean.	Max.	Min.	Rain and melted snow.	No. of days on which rain or snow fell.	Monthly resultant; No. of times in 1000.	7 A. M.	2 P. M	9 P. M.	Mean.	7 A.M.	2 P.M.	9 P.M.	Mean.	Max.	Min.
	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	inch.	inch.	inch.	inch.	inch.	inch.	inch.							°	°	°	°	°	°
January . .	80	61	73	71 4	95	21	.136	.144	.143	.141	.308	.040	3.351	7	N. 89° 9′ W., 402	6.6	6.4	5.1	6.0	23.43	24.99	24.93	24.45	45.8	—1.5
February . .	74	59	72	68.2	100	35	.124	.154	.150	.143	.434	.024	2.724	7	N. 61° 52′ W., 298	5.3	4.9	4.4	4.9	19.89	24.42	24.79	22.98	55.1	—12.6
March . . .	71	44	61	59.1	97	16	.171	.175	.182	.176	.497	.064	1.323	8	N. 79° 17′ W., 224	6.1	5.5	4.0	5.2	29.48	28.62	30.69	29.60	58.9	8.5
April. . . .	70	50	67	62.5	100	21	.210	.234	.230	.225	.500	.081	3.646	15	N. 88° 36′ W., 250	5.2	5.9	5.2	5.4	34.21	35.91	36.86	35.66	59.0	13.8
May	76	57	76	69.5	94	28	.395	.421	.420	.412	.638	.224	3.589	19	N. 59° 2′ E , 070	7.5	6.7	6.5	6.9	51.83	53 54	53.41	52.93	66.0	37.4
June	68	48	67	61.1	94	26	.467	.464	.480	.470	.804	.211	3.706	10	N. 67° 23′ W., 236	5.9	5.7	3.3	5.0	56.29	56.07	57.04	56.47	72.7	35.8
July	66	43	65	58.4	90	29	.539	.505	.559	.534	.783	.288	0.851	10	S. 70° 1′ W., 135	5.2	5.9	4.0	5.0	60.02	58.29	61.51	59.94	72.0	44.0
August . . .	77	52	73	67.5	94	27	.580	.584	.603	.589	.850	.275	9.260	13	N. 80° 51′ W., 150	5.3	5.7	4.8	5.3	62.54	62.57	63.73	62.94	74.4	42.7
September . .	77	50	72	66.5	93	35	.425	.437	.455	.439	.822	.161	2.907	7	S. 74° 26′ W., 397	6.2	5.0	3.5	4.9	52.85	53.14	54.60	53.53	73.4	29.2
October . . .	80	61	77	72.8	95	41	.321	.363	.354	.346	.639	.172	4.685	13	S. 75° 58′ W., 069	6.4	6.2	5.0	5.9	45.56	48.64	48.33	47.51	66.0	30.8
November . .	76	57	71	68.2	93	35	.234	.228	.236	.233	.568	.058	6.057	12	N. 81° 25′ W., 333	6.4	6.1	4.8	5.8	36.17	35.21	36.44	35.94	62.6	6.5
December . .	79	66	73	72.5	92	38	.132	.140	.134	.135	.275	.056	3.301	8	N. 51° 45′ W., 411	6.4	6.9	4.8	6.0	23.67	24.99	24.00	24.22	42.7	5.6
Annual means	75	54	71	66.5	100	16	.311	.321	.329	.320	.850	.024	45.400	129	N. 79° 43′ W., 219	6.0	5.9	4.6	5.5	41.33	42.19	43.03	42.18	74.4	—12.5
Winter . . .	77	63	74	71.3	100	24	.136	.156	.150	.147	.551	.024	9.535	24	N. 67° 50′ W., 289	6.3	6.3	4.8	5.8	22.47	25.55	25.09	24.36	61.7	—12.5
Spring . . .	73	50	68	63.7	100	16	.259	.277	.277	.271	.638	.064	8.558	42	N. 76° 26′ W., 119	6.3	6.0	5.2	5.8	38.51	39.36	40.32	39.40	66.0	8.5
Summer. . .	71	48	68	62.3	94	26	.529	.518	.547	.531	.850	.211	13.817	33	N. 82° 27′ W., 165	5.5	5.8	4.0	5.1	59.61	58.98	60.76	59.78	74.4	35.3
Autumn . .	78	56	74	69.2	95	35	.327	.343	.348	.339	.822	.058	13.649	32	S. 84° 34′ W., 254	6.3	5.8	4.4	5.5	44.86	45.66	46.46	45.66	73.4	6.5
For eight years.	76	58	72	68.9	100	13	.327	.345	.347	.340	1.059	.013	44.692	126	N. 74° 51′ W., 215	5.9	6.0	4.4	5.4		43.74			79.7	—16.5

TABLE I. BIRTHS.—*Table of Births for Six Months under the new Law of Registration, from July 1st to December 31st, 1860, with the Wards, Sexes, and Colour designated, and with Percentage and Ratio of Births to Population for each Ward.*

MONTHS.	WHITE.		BLACK.		STILLBORN.		WARDS.												
	M.	F.	M.	F.	M.	F.	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.
July	789	710	5	10	..	..	112	79	47	50	31	37	78	34	44	50	47	44	46
August	816	759	15	7	..	..	93	70	54	74	53	35	81	44	28	55	45	40	50
September	734	668	15	4	..	..	67	67	66	57	33	35	65	28	26	41	45	55	33
October	731	640	11	16	..	..	94	73	43	57	47	42	55	22	31	41	42	49	63
November	595	642	19	13	..	..	61	66	37	62	41	26	51	33	27	43	54	38	50
December	658	589	17	16	..	..	70	53	41	57	29	39	31	23	26	39	53	47	46
Total	4,426	4,008	82	66	208	139	497	408	291	357	234	214	361	184	185	269	286	273	288
Population of each ward							37,078	23,097	19,976	23,633	24,885	14,928	31,397	27,811	17,215	21,967	16,717	16,811	20,132
Percentage of births to population							1.34	1.76	1.45	1.15	0.90	1.43	1.14	0.66	1.07	1.22	1.71	1.62	1.43
Ratio of births to population							74.60	56.61	68.81	66.19	106.34	69.75	86.97	151.14	93.05	81.66	58.41	61.59	69.90

MONTHS.	WARDS.											Wards not given.	Total.	Twins.	Triplets.
	14.	15.	16.	17.	18.	19.	20.	21.	22.	23.	24.				
July	60	71	52	97	40	104	103	41	54	60	64	39	1,499	10	..
August	69	81	71	74	63	101	89	52	44	45	83	59	1,575	15	..
September	59	76	52	89	50	111	93	33	42	63	77	20	1,402	7	..
October	58	68	53	69	45	110	80	37	43	57	56	9	1,374	5	..
November	70	80	50	70	52	111	77	40	39	49	69	10	1,337	9	1
December	61	65	49	57	52	86	85	34	34	38	78	18	1,247	11	..
Total	377	441	327	456	302	623	527	237	256	312	426	155	8,434	57	1
Population of each ward	24,336	32,431	20,092	23,328	20,480	39,271	30,152	17,164	17,286	24.093	23,781				
Percentage of births to population	1.54	1.35	1.62	1.95	1.47	1.58	1.74	1.38	1.48	1.29	1.79				
Ratio of births to population	64.55	73.53	61.44	51.15	67.81	63.03	57.21	72.46	67.52	77.22	55.82				

TABLE II. MARRIAGES.—*Number of Marriages Registered under the new Law of Registration, from July* 1st *to December* 31st, 1860; *with the Nativity of the Brides and Grooms.*

BIRTHPLACE OF GROOMS.	BIRTHPLACE OF BRIDES.			Total of grooms.
	United States.	Foreign.	Not given.	
United States . .	999	125	14	1,138
Foreign . . .	220	801	4	1,025
Not given . . .	14	10	123	147
Total of brides . .	1,233	936	142	2,310

TABLE III. MARRIAGES.—*Ages of Persons Married, and Recorded for Six Months, under the new Registration Law, from July* 1st *to December* 31st, 1860.

AGES OF THE MALES.	AGES OF THE FEMALES.								Total of the males.
	Under 20	20 to 25	25 to 30	30 to 40	40 to 50	50 to 60	60 to 70	Age not given.	
Under 20	7	2	...	...	...	...	...	1	10
20 to 25	320	443	54	9	2	...	...	6	834
25 to 30	102	354	143	32	2	...	...	2	635
30 to 40	29	127	143	118	7	1	...	8	433
40 to 50	2	13	24	44	22	2	...	...	107
50 to 60	...	2	4	12	7	4	...	...	29
60 to 70	1	2	...	2	7	4	2	...	18
Age not given	3	5	1	...	...	...	...	235	244
Total of females	464	948	369	217	47	11	2	252	2310

TABLE IV.—*Report of Deaths from different Causes, with the Ages and the Sexes, from January 1st to June 30th, 1860.*

DISEASES.	SEX.				AGES.																
	Males.	Females.	Boys.	Girls.	Under 1 year.	1 to 2.	2 to 5.	5 to 10.	10 to 15.	15 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 to 90.	90 to 100.	100 to 110.	ADULTS.	CHILDREN.
Abscess	5	8	2	3	3	..	1	..	..	1	3	2	3	..	..	..	..	..	..	8	5
Anæmia	3	8	2	2	1	1	1	..	..	1	3	2	1	..	..	1	..	..	..	7	4
Aneurism	1	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	1	..
Albuminuria	2	1	..	..	..	..	..	..	..	..	..	..	3	..	..	..	..	..	..	3	..
Apoplexy	35	27	1	3	..	1	2	1	..	..	3	7	8	8	14	14	4	..	..	58	4
Asphyxia	3	5	3	3	6	..	..	..	..	..	..	..	..	..	..	1	1	..	..	2	6
Asthma	8	11	5	2	5	2	..	..	..	..	..	1	1	2	5	3	..	..	..	12	7
Burns	18	23	15	13	10	8	10	..	..	..	5	3	3	..	..	1	1	..	..	13	28
Cancer and scirrhus	8	20	..	..	..	..	..	..	..	..	3	4	12	2	4	2	1	..	..	28	..
" of the breast	..	4	..	..	..	..	..	..	..	..	..	..	1	1	2	..	..	..	..	4	..
" " liver	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	1	..
" " stomach	2	5	..	..	..	..	..	..	..	..	..	..	1	2	3	1	..	..	..	7	..
" " uterus	..	28	..	..	..	..	..	..	..	..	4	3	9	8	3	1	..	..	..	28	..
Casualties	48	11	12	3	5	..	7	2	..	1	13	16	5	7	1	1	..	1	..	44	15
Croup	124	85	124	85	37	68	98	6	..	..	..	..	..	..	..	..	..	..	..	..	209
Caries	..	1	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	1	..
Congestion of the brain	69	48	38	30	28	17	12	4	2	5	7	13	11	9	5	3	1	..	..	49	68
" " lungs	48	34	33	22	26	10	10	5	2	2	2	4	7	3	8	2	1	..	..	27	55
Cholera infantum	29	29	29	29	50	7	1	..	..	..	..	..	..	..	..	..	..	..	..	..	58
" morbus	..	3	..	1	..	..	..	..	..	1	..	..	1	1	..	..	..	..	..	2	1
Consumption of the lungs	411	419	40	59	11	9	2	10	14	53	268	200	123	73	50	15	2	..	..	731	99
Convulsions	136	138	128	135	159	67	29	4	2	2	2	..	4	2	2	1	..	..	..	11	263
Cyanosis	16	11	16	11	26	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	27
Diphtheria	37	56	37	55	12	14	42	18	5	1	..	..	..	1	..	..	..	..	..	1	92
Diarrhœa	20	26	12	13	17	4	3	..	1	..	3	2	5	2	4	4	1	..	..	21	25
Dropsy of the brain	73	40	70	39	42	31	28	4	1	3	1	..	1	1	..	1	..	..	..	4	109
" " chest	41	46	4	4	..	..	2	4	..	2	7	9	20	12	16	11	4	..	..	79	8
" " heart	4	3	1	1	..	..	1	1	..	..	..	4	1	..	..	..	..	..	..	5	2
Diabetes	2	1	..	..	..	..	..	..	..	..	..	..	..	2	1	..	..	..	..	3	..
Disease of the brain	39	40	21	20	15	9	8	5	2	2	10	10	7	3	4	3	1	..	..	38	41
" " heart	83	83	19	21	7	1	6	8	6	12	14	18	33	15	26	17	3	..	..	126	40
" " kidneys	10	4	1	1	..	..	2	..	..	..	..	2	2	2	..	6	..	..	..	12	2
" " spine	11	8	4	6	4	1	2	3	..	..	2	1	2	1	2	1	..	..	..	9	10
Drowned	46	4	9	1	..	..	1	3	4	2	10	19	4	4	4	..	..	..	..	41	10
Debility	126	104	61	50	95	8	4	1	1	2	16	12	14	13	29	28	6	..	1	119	111
Dysentery	27	13	19	10	16	7	2	3	..	1	3	..	3	1	2	1	..	1	..	11	29
Dyspepsia	..	2	..	..	..	..	..	..	..	..	1	..	..	..	..	1	..	..	..	2	..

TABLE IV.—*Report of Deaths*—Continued.

DISEASES.	SEX.				AGES.																
	Males.	Females.	Boys.	Girls.	Under 1 year.	1 to 2.	2 to 5.	5 to 10.	10 to 15.	15 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 to 90.	90 to 100.	100 to 110.	ADULTS.	CHILDREN.
Effusion of the brain	16	24	13	21	13	11	7	1	1	1	1	1	1	..	3	..	..	..	..	6	34
Epilepsy	10	5	3	3	2	1	1	1	1	..	4	1	1	1	2	..	..	..	..	9	6
Erysipelas.	22	25	5	14	9	3	3	2	..	2	8	4	4	3	4	4	1	..	..	28	19
Fracture	3	3	..	..	..	..	..	..	..	..	1	1	1	..	2	..	1	..	..	6	..
Fever, bilious	1	2	..	..	..	..	..	..	..	..	1	1	..	..	1	..	..	..	..	3	..
" continued	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	1	..
" congestive	1	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	1	..
" gastric	1	..	1	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
" hectic	..	2	..	1	..	..	..	1	..	..	..	1	..	..	..	..	..	..	..	1	1
" intermittent	..	1	..	1	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	1
" nervous	..	1	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	1	..
" puerperal	..	35	..	2	..	..	..	..	..	2	15	17	1	..	..	..	..	..	..	33	2
" remittent	7	4	3	1	..	..	3	..	..	1	2	3	..	1	1	..	..	..	..	7	4
" scarlet	110	96	107	94	26	53	91	23	4	4	2	3	..	..	..	..	..	..	..	5	201
" typhus	6	10	2	4	..	..	1	2	2	1	3	2	2	1	1	1	..	..	..	10	6
" typhoid	43	54	9	21	..	2	8	7	6	7	19	15	11	5	9	6	2	..	..	67	30
Gangrene	4	4	2	4	..	..	3	1	2	..	1	..	..	..	..	1	..	..	..	2	6
Gout	2	2	..	..	..	..	..	..	..	..	..	1	..	..	2	1	..	..	..	4	..
Hemorrhage	9	6	3	2	2	1	..	..	1	1	3	2	1	1	2	1	..	..	..	10	5
" of the stomach and bowels	2	2	1	1	2	..	..	..	..	..	..	..	1	..	1	..	..	..	..	2	2
" " lungs	6	12	2	4	1	3	1	1	..	..	3	4	2	1	2	..	..	..	..	12	6
" " uterus	..	4	..	..	..	..	..	..	..	..	1	3	..	..	..	..	..	..	..	4	..
Hernia	2	4	..	1	..	..	..	..	..	1	1	1	2	1	..	..	..	..	..	5	1
Hooping-cough	18	19	18	19	24	11	1	..	1	..	..	..	..	..	..	..	..	..	..	..	37
Inflammation of the brain . . .	76	61	69	53	48	41	15	12	2	4	2	4	3	..	2	4	..	..	..	15	122
" " bronchi . . .	34	30	20	20	25	6	7	..	1	1	3	4	2	3	6	5	1	..	..	24	40
" " liver . . .	22	18	1	2	..	..	..	1	1	1	8	6	5	10	7	1	..	..	..	37	3
" " lungs . . .	174	137	115	86	102	44	34	11	4	6	19	19	15	16	22	11	5	2	1	110	201
" " larynx . . .	14	13	9	9	3	3	8	2	..	2	2	1	4	1	1	..	..	..	..	9	18
" " pleura . . .	4	5	2	..	..	2	..	..	..	..	1	2	..	1	2	..	1	..	..	7	2
" " peritoneum . .	7	7	2	1	..	1	..	..	1	1	5	3	2	..	..	1	..	..	..	11	3
" " stomach and bowels	61	53	28	20	35	4	5	1	1	2	13	14	8	17	8	5	1	..	..	66	48
" " uterus . . .	..	7	..	..	..	..	..	..	..	..	4	2	1	..	..	..	..	..	..	7	..
Inanition	40	36	35	28	55	3	4	1	..	..	1	2	2	1	2	1	3	1	..	13	63
Insanity	1	2	..	..	..	..	..	..	..	..	1	..	..	2	..	..	..	..	..	3	..
Intussusception	2	1	2	1	2	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	3
Jaundice	3	4	1	1	1	1	..	..	..	..	..	..	1	2	2	..	..	..	..	5	2

TABLE IV.—*Report of Deaths*—Continued.

DISEASES.	SEX.				AGES.															ADULTS.	CHILDREN.
	Males.	Females.	Boys.	Girls.	Under 1 year.	1 to 2.	2 to 5.	5 to 10.	10 to 15.	15 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 to 90.	90 to 100.	100 to 110.		
Mania à potu	50	17	..	..	..	..	..	..	..	..	12	25	21	6	3	..	..	..	..	67	..
Marasmus	71	80	64	71	100	17	10	7	1	..	..	2	3	..	6	2	3	..	..	16	135
Measles	2	3	2	3	1	3	1	..	..	..	..	..	..	..	..	..	..	..	..	..	5
Malformation	1	2	1	1	1	1	..	..	..	..	..	..	..	..	1	..	..	..	..	1	2
Mortification	2	..	1	..	..	1	..	..	..	..	..	..	..	..	1	..	..	..	..	1	1
Old age	45	84	..	..	..	..	..	..	..	..	..	..	..	..	2	36	56	23	2	129	..
Palsy	35	28	2	..	..	..	..	2	..	..	1	6	7	11	18	10	5	3	..	61	2
Pyohæmia	4	1	1	..	..	..	1	..	..	..	2	..	..	1	1	..	..	..	..	4	1
Rheumatism	7	3	3	..	..	..	1	1	..	1	1	2	1	1	1	1	..	..	..	7	3
Scrofula	15	8	10	8	7	1	6	1	1	2	2	1	1	1	..	..	..	..	..	5	18
Smallpox	7	3	5	1	2	2	1	..	..	1	3	..	1	..	..	..	..	..	..	4	6
Strangulation	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	1	..
Syphilis	2	2	1	2	3	..	..	..	..	..	..	..	1	..	..	..	..	..	..	1	3
Stillborn	192	180	192	180	372	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	372
Sore throat	11	16	10	16	5	7	5	7	2	..	1	..	..	..	..	..	..	..	..	1	26
Suicide	7	2	..	..	..	..	..	..	..	..	4	1	2	2	..	..	..	..	..	9	..
Tabes mesenterica	6	2	5	2	1	1	4	1	..	..	..	1	..	..	..	..	..	..	..	1	7
Teething	11	4	10	4	12	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	15
Tetanus	4	5	1	2	1	..	1	..	1	..	3	1	1	..	..	..	1	..	..	6	3
Tumours	3	2	..	..	..	..	..	..	..	..	1	1	1	..	2	..	..	..	..	5	..
Tympanitis	..	1	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	1	..
Ulceration	3	..	2	..	1	..	1	..	..	..	..	1	..	..	..	..	..	..	..	1	2
" of the stomach and bowels	5	4	..	..	..	..	..	..	..	..	1	1	1	1	5	..	..	..	..	9	..
" " throat	1	1	..	1	..	1	..	..	..	..	..	..	1	..	..	..	..	..	..	1	1
" " uterus	..	1	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	1	..
Unknown	32	26	9	13	10	8	2	1	..	1	10	8	8	5	3	2	..	..	..	36	22
Worms	..	1	..	1	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	1
Want and neglect	3	4	1	4	5	..	..	..	..	..	..	..	2	..	..	..	..	..	..	2	5
Total, 5,226.	2,708	2,518	1,480	1,345	1,447	500	503	169	73	133	546	498	410	271	311	214	116	31	4	2,401	2,825

DISEASES.	SEX.				AGES.															Adults.	Minors.	Total.
	Males.	Females.	Boys.	Girls.	Under 1 year.	1 to 2.	2 to 5.	5 to 10.	10 to 15.	15 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 to 90.	90 to 100.	100 to 110.			
Abscess	12	19	5	12	5	1	3	6	1	1	5	2	3	1	2	1	..	..	..	14	17	31
" of liver	2	5	1	4	2	..	1	1	..	1	1	1	..	..	..	..	..	..	..	2	5	7
Albuminuria	4	2	1	1	..	..	1	1	..	..	..	2	2	..	..	..	..	..	..	4	2	6
Anæmia	1	4	..	3	1	..	2	..	..	..	..	..	1	1	..	..	..	..	..	2	3	5
Aneurism	2	1	..	..	..	..	..	..	..	..	..	1	..	2	..	..	..	..	..	3	..	3
Aphthæ	1	2	1	2	2	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	3
Apoplexy	49	32	6	3	7	..	..	2	..	..	4	13	10	15	19	7	4	..	..	72	9	81
Asphyxia	10	8	10	8	17	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	18	18
Asthma	8	5	2	..	2	..	..	..	..	..	1	2	..	2	2	4	..	..	..	11	2	13
Cancer and scirrhus	11	15	2	2	..	2	1	..	1	..	..	5	2	6	6	2	1	..	..	22	4	26
" of the breast	..	12	..	..	..	..	..	..	..	..	..	3	1	3	3	2	..	..	..	12	..	12
" " liver	3	..	..	..	..	..	..	..	..	..	..	..	1	1	1	..	..	..	..	3	..	3
" " stomach and bowels	13	9	..	..	..	..	..	..	..	..	..	3	8	4	6	1	..	..	..	22	..	22
" " uterus	..	13	..	..	..	..	..	..	..	..	..	1	4	5	..	3	..	..	..	13	..	13
Casualties	75	13	29	11	10	5	5	9	8	3	13	13	9	5	7	1	..	..	..	48	40	88
Burns and scalds	11	25	9	18	2	3	10	6	1	5	2	3	1	1	..	1	1	..	..	9	27	36
Drowned	70	7	25	4	1	..	2	11	9	6	13	18	10	5	2	..	..	..	..	48	29	77
Exposure	..	4	..	..	..	..	..	..	..	..	1	..	2	..	..	1	..	..	..	4	..	4
Fracture	6	2	..	..	..	..	..	..	..	..	..	1	3	..	2	..	2	..	..	8	..	8
Neglect and want	5	10	3	9	10	1	1	..	..	..	..	1	1	1	..	..	..	..	..	3	12	15
Poisoning	2	2	..	2	..	..	1	..	..	1	..	1	..	..	1	..	..	..	..	2	2	4
Suicide	10	1	2	..	..	..	..	..	..	2	2	3	1	3	..	..	..	..	..	9	2	11
Violence	4	..	..	..	..	..	..	..	..	..	..	2	1	1	..	..	..	..	..	4	..	4
Caries	3	..	2	..	..	1	1	..	..	..	..	1	..	..	..	..	..	..	..	1	2	3
Cholera	3	1	1	..	1	..	..	..	..	..	1	1	..	..	1	..	..	..	..	3	1	4
" infantum	244	212	244	212	340	103	12	1	..	..	..	..	..	..	..	..	..	..	..	..	456	456
" morbus	11	10	4	3	3	1	1	1	..	1	..	3	5	1	2	2	1	..	..	14	7	21
Congestion of the brain	74	63	45	43	36	20	18	9	3	2	11	14	9	6	5	3	1	..	..	49	88	137
" " liver	..	1	..	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1
" " lungs	24	23	16	9	18	2	3	2	..	..	5	7	2	2	3	3	..	..	..	22	25	47
Consumption of the lungs	374	418	42	72	13	10	8	10	17	56	270	165	115	70	39	13	5	1	..	678	114	792
Convulsions	123	116	115	108	132	49	30	6	4	2	6	4	2	3	1	..	..	..	..	16	223	339
" puerperal	..	4	..	..	..	..	..	..	..	..	2	2	..	..	..	..	..	..	..	4	..	4
Croup	94	51	94	49	15	33	69	26	..	..	2	..	..	..	..	..	..	..	..	2	143	145
Colic	1	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	1	..	1
Cyanosis	13	12	13	12	24	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	25	25
Cirrhosis	2	3	..	..	..	..	..	..	..	..	..	..	1	2	1	1	..	..	..	5	..	5
Coup de soleil	2	..	..	..	..	..	..	..	..	..	1	..	..	..	1	..	..	..	..	2	..	2
Debility	159	149	87	85	155	8	7	..	..	2	6	13	17	10	33	31	19	6	1	136	172	308
Diabetes	7	1	1	..	1	..	..	..	..	..	1	2	2	..	1	1	..	..	..	7	1	8
Diphtheria	105	109	97	106	25	42	69	54	9	4	5	3	..	1	1	1	..	..	..	11	203	214
Diarrhœa	49	47	29	31	38	17	3	1	..	1	3	4	7	8	8	4	1	1	..	36	60	96
Disease of the brain	51	27	20	16	18	7	5	1	1	1	6	3	9	7	9	6	2	..	..	42	36	78

TABLE V.—*Deaths under the new Law of Registration*—Continued.

DISEASES.	SEX.				AGES.															ADULTS.	MINORS.	TOTAL.
	Males.	Females.	Boys.	Girls.	Under 1 year.	1 to 2.	2 to 5.	5 to 10.	10 to 15.	15 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 to 90.	90 to 100.	100 to 110.			
Disease of the heart	52	69	16	25	15	2	3	6	4	11	10	19	7	15	15	11	1	2	..	80	41	121
" " kidneys	16	13	2	2	..	1	1	1	..	1	3	2	6	4	7	2	1	..	..	25	4	29
" " liver	6	1	3	..	2	..	..	..	..	1	..	1	1	..	1	1	..	..	..	4	3	7
" " chest	..	1	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	1	..	1
" " lungs	1	..	1	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1
" " throat	1	1	1	..	1	..	..	..	..	..	1	..	..	..	..	..	..	..	..	1	1	2
" " spine	2	5	2	3	1	..	..	2	1	1	..	1	1	..	..	..	..	..	..	2	5	7
" " spleen	..	1	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	1	..	1
Dropsy (including abdominal dropsy)	33	40	12	9	1	1	10	6	2	1	5	4	6	7	11	9	8	2	..	52	21	73
" of the brain	69	65	68	65	78	36	16	2	..	1	..	..	1	..	..	..	..	..	..	1	133	134
" " chest	35	26	8	6	1	1	4	4	..	4	2	5	5	15	9	9	2	..	..	47	14	61
" " heart	13	15	7	5	..	..	4	5	1	2	4	1	..	6	..	2	3	..	..	16	12	28
Dysentery	73	65	50	38	38	20	22	6	..	2	9	10	6	8	4	6	5	2	..	50	88	138
Dyspepsia	1	1	1	..	1	..	..	..	..	..	..	..	..	..	..	1	..	..	..	1	1	2
Eczema	..	1	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1
Effusion on the brain	17	19	13	16	16	4	6	2	..	1	1	1	3	1	1	..	..	..	..	7	29	36
Enlargement of the heart	1	4	..	1	..	..	..	1	..	..	2	..	1	1	..	..	..	..	..	4	1	5
Epilepsy	3	4	2	2	1	..	2	1	..	..	1	..	1	1	..	..	..	..	..	3	4	7
Elephantiasis	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	1	..	1
Erysipelas	18	15	11	6	12	2	1	1	..	1	2	1	7	3	1	..	2	..	..	16	17	33
Fever	..	1	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	1	..	1
" bilious	5	4	..	2	1	..	..	1	..	..	1	3	3	..	..	..	..	..	..	7	2	9
" congestive	1	1	1	1	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	2	2
" enteric	1	..	1	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1
" intermittent	3	1	..	..	..	..	..	..	..	..	..	2	1	..	..	1	..	..	..	4	..	4
" nervous	..	2	..	..	..	..	..	..	..	..	1	..	1	..	..	..	..	..	..	2	..	2
" puerperal	..	12	..	..	..	..	..	..	..	..	7	5	..	..	..	..	..	..	..	12	..	12
" remittent	4	3	2	1	..	66	1	..	..	2	2	..	..	1	1	..	..	..	..	4	3	7
" scarlet	193	193	196	192	21	..	199	88	6	2	..	..	..	..	..	..	..	..	..	..	385	385
" typhoid	68	47	25	15	4	..	8	11	5	12	39	15	5	5	5	4	2	..	..	75	40	115
" typhus	14	8	4	4	..	..	1	1	2	4	3	5	2	1	1	2	..	..	..	14	8	22
Fever, typhus icterodes	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	1	..	1
Gangrene	10	2	4	1	2	..	..	3	..	..	..	2	..	2	1	2	..	..	..	7	5	12
Gout	2	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	2	..	2
Hemorrhage	12	11	5	4	6	..	1	1	1	..	3	4	5	..	1	1	..	..	..	14	9	23
" of the lungs	7	2	1	..	..	1	..	..	..	..	..	4	1	..	..	1	..	..	..	8	1	9
" " stomach and bowels	1	2	..	1	..	..	..	..	..	1	1	1	..	..	..	..	..	..	..	2	1	3
" " uterus	..	4	..	1	..	..	..	..	..	1	2	1	..	..	..	..	..	..	..	3	1	4
Hernia	6	5	..	..	..	..	..	..	..	..	1	..	5	4	..	1	..	..	..	11	..	11
Hooping-cough	7	11	7	11	10	5	3	..	..	..	..	..	..	..	..	..	..	..	..	..	18	18
Inanition	53	34	46	28	66	4	3	1	..	..	5	1	2	..	..	2	3	..	..	13	74	87

DISEASES.	SEX.				AGES.																	
	Males.	Females.	Boys.	Girls.	Under 1 year.	1 to 2.	2 to 5.	5 to 10.	10 to 15.	15 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 to 90.	90 to 100.	100 to 110.	ADULTS.	MINORS.	TOTAL.
Inflammation of the bronchi	20	23	10	12	11	6	4	1	..	..	..	3	4	3	5	4	2	..	..	21	22	43
" " chest	..	1	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	1	..	1
" " larynx	7	4	5	4	2	1	4	1	1	..	1	1	..	..	..	..	..	..	..	2	9	11
" " heart	4	5	2	4	..	..	..	3	2	1	..	1	1	..	..	1	..	..	..	3	6	9
" " liver	16	17	4	1	2	..	..	1	1	1	..	7	4	4	5	4	4	..	..	28	5	33
" " kidneys	3	1	1	..	..	..	..	1	..	..	1	..	..	..	1	..	1	..	..	3	1	4
" " lungs	94	97	56	56	51	19	22	9	3	8	15	16	17	12	7	8	4	..	..	79	112	191
" " peritoneum	25	21	7	3	3	2	1	2	1	1	15	10	7	6	1	..	..	..	..	39	10	49
" " hip	2	1	2	..	..	..	..	1	1	..	..	..	..	1	..	..	..	..	..	1	2	3
" " pleura	4	..	..	..	..	..	..	..	..	..	1	1	1	..	1	..	..	..	..	4	..	4
" " stomach and bowels	87	78	51	42	44	16	16	10	3	4	14	17	14	11	10	3	1	2	..	72	93	165
" " throat	3	1	3	1	..	..	1	3	..	..	..	..	..	..	..	..	..	..	..	..	4	4
" " uterus	..	4	..	..	..	..	..	..	..	..	2	2	..	..	..	..	..	..	..	4	..	4
" " leg	1	..	1	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	1	1
Intussusception	3	..	..	..	..	..	..	..	..	..	..	..	..	3	..	..	..	..	..	3	..	3
Jaundice	6	4	3	2	4	..	1	..	..	..	..	1	..	4	..	..	..	..	..	5	5	10
Mania	1	6	..	..	..	..	..	..	..	..	2	1	1	2	..	1	..	..	..	7	..	7
Mania a potu	37	13	..	..	..	..	..	..	..	..	5	19	16	8	2	..	..	..	..	50	..	50
Marasmus	193	131	176	127	213	65	18	6	..	1	5	3	6	2	4	2	2	..	..	24	303	327
Measles	6	4	6	4	2	3	3	..	..	2	..	..	..	..	..	..	..	..	..	..	10	10
Old age	28	56	..	..	..	..	..	..	..	..	..	..	..	..	..	21	40	16	4	84	..	84
Neuralgia	1	1	..	..	..	..	..	..	..	..	1	..	..	..	..	..	1	..	..	2	..	2
Palsy	35	32	3	5	2	1	1	3	..	1	3	2	6	7	18	17	5	..	1	59	8	67
Pyohæmia	4	1	..	..	..	..	..	..	..	..	1	1	3	..	..	..	..	..	..	5	..	5
Rheumatism	6	6	2	3	1	1	2	..	..	1	1	1	1	1	2	1	..	..	..	7	5	12
Scrofula	32	16	24	12	13	5	6	2	6	4	7	1	1	3	..	..	..	..	..	12	36	48
Smallpox	22	25	21	23	11	8	15	6	2	2	2	1	..	..	..	..	..	..	..	3	44	47
Softening of the brain	5	1	1	..	..	..	..	1	..	..	..	1	..	2	1	..	1	..	..	5	1	6
Stricture of œsophagus	..	1	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	1	..	1
Stillborn	208	139	208	139	347	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	347	347
Syphilis	1	4	1	3	1	1	1	1	..	..	1	..	..	..	..	..	..	..	..	1	4	5
Tabes mesenterica	13	5	13	5	9	3	4	1	..	1	..	..	..	..	..	..	..	..	..	..	18	18
Teething	13	11	13	11	12	11	1	..	..	..	..	..	..	..	..	..	..	..	..	..	24	24
Tetanus	9	3	1	3	1	..	1	..	1	1	4	1	2	..	1	..	..	..	..	8	4	12
Tumours	3	5	1	..	..	..	..	1	..	..	2	1	3	1	..	..	..	..	..	7	1	8
Ulceration	..	2	..	2	1	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	2	2
" of the stomach and bowels	5	5	2	2	..	2	1	..	1	..	..	2	2	1	..	..	..	1	..	6	4	10
" " throat	4	..	4	..	..	2	1	1	..	..	..	..	..	..	..	..	..	..	..	..	4	4
Unknown	45	31	22	18	20	6	6	6	2	..	6	11	7	7	5	..	..	..	..	36	40	76
worms	..	2	..	2	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	2	2
Uræmia	1	1	..	1	..	..	1	..	..	..	..	1	..	..	..	..	..	..	..	1	1	2
Total	3,401	2,941	2,114	1,780	1,941	634	679	364	103	173	563	502	402	325	280	212	125	33	6	2,450	3,894	6,542

TABLE VI.—*Deaths in each Ward from July 1st to December 19th, 1860, with the Nativity; also those from the Almshouse, the People of Colour, and those from the Country.*

DISEASES.	ALMSHOUSE.	PEOPLE OF COLOUR.	COUNTRY.	NATIVITY.			WARDS.																								UNKNOWN WARDS.
				United States.	Foreign.	Unk'n.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
Abscess	1	..	..	23	7	1	1	3	..	1	1	..	1	3	1	3	2	..	..	3	1	..	3	1	2	1	..	..	1	2	1
" of liver	..	..	..	6	1	..	1	..	..	1	..	..	..	..	..	1	..	..	..	1	..	..	1	1	1	..	..	..	..	..	..
Albuminuria	3	..	..	2	1	3	..	..	..	1	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	1	3	..	..
Anæmia	..	1	1	4	1	..	..	1	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..
Aneurism	..	1	..	2	1	..	1	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..
Aphthæ	..	..	..	3	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	1	..	..	..	..	..	..	..	1	..	..	..
Apoplexy	1	7	4	51	27	3	7	4	..	2	3	2	5	4	3	7	7	4	1	2	1	2	3	2	2	2	1	5	3	2	3
Asphyxia	..	2	1	18	..	..	2	1	2	..	1	1	1	2	1	..	1	..	1	..	1	..	1	..	..	..	..	..	..	1	1
Asthma	..	1	..	7	5	1	..	..	1	..	4	..	..	1	..	..	..	..	..	1	..	..	..	..	2	..	..	1	1	..	2
Cancer and scirrhus	4	3	1	14	7	5	1	1	1	2	..	..	2	1	..	2	1	..	..	3	1	1	2	1	..	1	..	..	1	4	..
" of breast	2	3	..	7	2	3	1	..	..	..	..	..	..	..	..	..	..	1	..	1	..	..	..	..	..	1	..	2	2	2	2
" of liver	..	..	..	2	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	1
" of stomach and bowels	1	1	..	13	8	1	..	..	..	1	2	1	1	..	..	2	1	2	..	2	1	1	1	..	..	1	1	2	..	3	..
" of uterus	..	1	..	10	2	1	..	..	..	1	..	..	..	2	..	..	..	..	1	2	1	1	1	..	..	1	..	..	1	..	2
Casualties	1	2	3	54	29	5	8	6	2	4	2	3	4	2	3	1	3	..	2	1	5	1	3	2	9	6	4	1	6	3	4
Burns and scalds	1	3	..	28	8	..	4	1	1	1	2	..	8	..	1	1	..	1	..	..	4	2	1	2	1	2	..	1	1	1	1
Drowned	..	1	3	40	19	18	3	3	4	2	6	6	1	3	3	..	4	4	..	2	2	1	..	4	6	2	1	3	1	3	10
Exposure	..	1	..	..	2	2	..	..	..	..	..	..	..	1	..	..	1	..	..	..	..	..	1	..	..	..	..	..	..	..	1
Fracture	..	..	1	1	5	2	..	..	1	1	..	..	3	..	..	..	..	..	..	..	1	..	..	..	1	..	..	..	..	..	..
Neglect and want	1	4	..	12	1	2	..	1	1	3	2	1	..	..	..	1	..	..	..	..	..	..	3	..	..	..	1	..	..	1	1
Poisoning	1	..	1	1	1	2	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	1	..
Suicide	..	..	1	7	3	1	..	1	..	..	1	1	1	..	1	..	..	..	..	..	..	..	..	1	..	2	..	..	..	..	2
Violence	..	..	..	1	3	..	2	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	1	..	..	..	..	..	..	..	..
Caries	..	..	..	2	1	..	..	..	..	1	..	..	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Cholera	..	..	..	1	3	..	..	..	..	..	..	..	1	1	..	1	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..
" infantum	6	20	8	447	6	3	30	25	13	28	13	12	32	19	11	16	13	17	7	9	19	13	20	12	46	21	8	18	14	16	13
" morbus	1	..	1	10	9	2	1	2	..	2	2	2	2	1	..	..	..	..	1	..	..	..	2	2	..	..	..	..	..	3	..
Congestion of brain	8	2	2	107	20	10	14	10	6	9	4	1	7	4	1	4	1	3	3	1	5	2	11	7	8	6	3	2	3	13	7
" liver	..	..	..	1	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
" lungs	2	4	..	36	9	2	6	4	1	5	2	1	4	1	..	..	..	..	..	1	1	2	5	3	1	2	..	1	..	4	3
Consumption of lungs	71	63	13	419	285	88	39	45	29	31	37	22	48	24	35	25	16	15	16	24	28	22	35	25	45	35	14	20	24	93	32
Convulsions	6	11	3	225	7	7	18	18	11	12	9	4	8	4	6	6	13	10	9	8	13	9	13	5	23	9	1	3	8	10	6
" puerperal	..	..	..	1	3	..	2	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..
Croup	2	1	2	138	3	4	12	10	4	3	1	7	4	2	4	2	2	5	2	3	11	5	11	9	12	8	4	3	10	8	1
Colic	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
Cyanosis	1	..	1	25	..	..	3	2	1	2	2	..	1	1	..	..	2	..	..	2	..	..	..	..	..	1	2	1	2	2	..
Cirrhosis	1	..	..	2	2	1	..	..	..	1	..	..	1	..	..	..	..	1	..	..	..	..	..	..	..	..	1	..	..	1	..
Coup de soleil	..	..	..	..	1	1	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
Debility	21	20	4	221	63	24	21	11	5	18	7	7	18	6	9	13	8	2	6	5	26	10	11	13	23	16	9	8	8	32	12
Diabetes	..	..	1	6	2	..	..	..	..	..	..	..	..	..	..	2	1	..	..	..	1	..	..	..	..	..	..	..	..	2	1
Diphtheria	..	2	3	204	7	3	21	10	10	8	6	5	11	5	6	6	6	4	6	18	15	6	5	11	19	13	3	3	5	5	4

DISEASES.	ALMSHOUSE.	PEOPLE OF COLOUR.	COUNTRY.	NATIVITY.			WARDS.																								UNKNOWN WARDS.
				United States.	Foreign.	Unk'n.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
Disease of the brain	8	1	2	55	14	9	1	3	1	2	2	1	8	6	2	2	2	4	1	3	9	4	..	2	4	1	3	..	2	10	3
“ “ heart	4	9	7	83	33	5	4	2	6	3	6	7	12	5	8	3	3	2	3	5	4	6	2	6	6	5	3	4	3	4	2
“ “ kidneys	1	..	1	14	13	2	1	2	1	2	2	..	4	1	1	1	1	1	1	..	1	2	2	..	1	1	1	1	..	1	..
“ “ liver	..	..	1	4	2	1	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	2	..	..	1	..	..	..	1	..
“ “ chest	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..
“ “ lungs	..	..	..	1	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
“ “ throat	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	1	..	..	..
“ “ spine	..	1	..	6	..	1	..	..	..	1	..	..	2	..	..	1	..	..	..	1	..	..	..	..	..	1	..	..	..	..	1
“ “ spleen	..	..	..	..	1	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Dropsy (including abdominal)	..	5	..	46	24	3	7	3	1	7	2	3	4	..	3	3	3	2	2	6	..	1	4	3	4	2	1	4	5	1	2
“ of the brain	1	6	..	130	1	3	7	9	5	8	9	1	5	4	4	4	7	2	2	..	7	4	12	7	14	4	8	1	2	2	6
“ “ chest	1	5	5	46	11	4	4	2	1	2	6	1	2	3	1	3	3	1	2	3	3	2	2	2	4	1	2	1	3	2	..
“ “ heart	5	1	1	16	4	8	2	..	2	2	1	..	..	..	..	2	..	..	1	..	2	1	..	1	2	1	..	..	..	9	1
Dysentery	6	7	5	104	26	8	5	5	12	7	4	4	4	3	3	1	3	1	..	4	6	9	9	7	9	10	4	7	7	8	1
Dyspepsia	..	..	..	2	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Eczema	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..
Effusion on the brain	1	2	2	30	4	2	1	1	2	2	4	1	2	1	2	3	..	..	2	2	1	..	1	2	..	1	..	2	2	2	..
Enlargement of the heart	..	..	..	2	3	..	..	..	..	..	..	1	1	..	..	..	..	..	..	1	1	..	..	..	1	..	..	..	..	..	..
Epilepsy	..	..	..	6	..	1	1	..	..	1	..	..	..	..	..	..	..	..	..	1	..	..	1	..	2	..	..	..	..	1	..
Elephantiasis	..	..	..	1	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Erysipelas	..	..	2	29	4	..	5	3	..	1	..	..	2	1	..	1	1	..	2	1	1	2	2	4	3	..	..	..	1	1	..
Fever	..	..	1	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
“ bilious	..	1	..	6	3	..	2	2	..	..	..	..	1	..	..	..	1	..	1	1	..	..	..	1	..	..	..	..	..	..	..
“ congestive	..	1	1	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..
“ enteric	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..
“ intermittent	..	..	..	3	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	1	1
“ nervous	..	..	1	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..
“ puerperal	..	..	..	4	5	3	1	..	..	3	..	..	..	1	..	..	1	..	..	..	..	..	..	..	4	..	1	..	..	1	..
“ remittent	..	..	1	6	1	..	..	..	..	..	..	..	..	..	1	..	1	..	..	1	..	1	..	..	..	..	1	..	..	1	..
“ scarlet	2	2	7	365	12	8	48	32	30	56	10	6	22	7	7	14	6	11	2	14	6	7	8	11	41	10	1	2	10	9	8
“ typhoid	6	4	2	68	41	6	7	8	4	8	3	1	6	4	3	2	4	2	5	4	7	3	3	4	8	6	2	2	3	10	4
“ typhus	1	3	1	18	3	1	1	1	1	..	..	1	3	..	2	1	..	1	..	2	..	1	..	1	2	1	..	..	1	2	..
“ “ icterodes	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Gangrene	1	..	..	9	2	1	..	..	..	1	1	..	..	..	..	1	2	..	..	..	..	..	..	1	1	1	..	1	..	3	..
Gout	..	..	1	2	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Hemorrhage	1	2	..	14	7	2	3	1	1	1	3	..	..	1	3	..	1	..	..	1	1	..	..	..	5	..	..	..	1	1	..
“ of lungs	..	..	..	4	4	1	..	..	..	..	..	2	..	..	2	2	..	..	..	..	..	..	..	1	1	..	..	..	1	..	..
“ of stomach & bowels	..	..	..	2	..	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	1	..	..	..	..	1
“ uterus	..	..	..	2	2	..	..	..	..	..	..	1	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	1	..
Hernia	..	1	1	7	4	..	..	..	2	2	..	..	1	..	1	1	..	..	..	..	1	..	..	..	1	..	..	..	..	..	1
Hooping-cough	..	3	1	18	..	..	1	..	..	..	1	1	1	..	..	1	2	..	2	..	1	2	1	1	..	1	..	1	..	1	..
Inanition	12	1	2	74	10	3	7	9	4	9	1	1	2	4	2	3	1	1	2	1	4	..	2	3	6	4	..	5	..	12	2
Inflammation of bladder	..	2	..	1	2	1	2	..	2	..	..	..	2	..	..	..	..	..	..	1	1	1	1	..	..	..	..	..	..	..	1
“ brain	..	1	5	114	11	4	9	8	5	2	1	3	5	6	4	6	5	3	1	5	8	6	8	4	10	4	1	7	3	5	5

TABLE VI.—*Deaths in each Ward for Six Months*—Continued.

DISEASES.	ALMSHOUSE.	PEOPLE OF COLOUR.	COUNTRY.	NATIVITY.			WARDS.																								UNKNOWN WARDS.
				United States.	Foreign.	Unk'n.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
Inflammation of bronchi	..	5	2	33	8	2	4	2	1	5	1	..	6	1	..	2	1	..	1	..	2	..	6	..	2	2	..	1	1	1	2
" chest	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..
" larynx	..	..	..	10	1	..	..	..	1	..	..	..	..	1	..	..	..	..	1	2	..	..	1	1	1	1	1	..	..	1	..
" heart	..	..	..	8	1	..	..	1	..	2	1	..	..	..	..	1	..	..	..	..	2	..	..	..	..	1	..	..	..	1	..
" liver	3	1	..	19	12	2	3	..	..	1	..	2	1	4	2	2	..	2	1	..	2	1	..	2	2	1	..	1	..	5	1
" kidneys	..	1	..	2	2	..	..	..	..	1	..	..	1	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
" lungs	10	20	5	148	32	11	21	10	10	16	4	3	17	7	5	7	8	3	4	3	6	6	6	8	4	9	3	2	4	15	5
" peritoneum	1	1	1	23	21	2	5	2	1	2	4	2	4	4	1	1	1	1	2	..	1	..	1	2	5	..	2	1	2	2	2
" hip	..	..	..	1	2	..	1	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	1	..
" pleura	..	..	..	..	4	..	1	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	1	..	1	..	..	..	..	..	..
" stomach & bowels	4	5	5	130	27	8	17	9	5	8	6	2	8	7	5	3	3	9	2	2	8	4	6	5	12	8	5	2	9	9	6
" throat	..	..	..	4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	1	1	..	..	..	1	..	..	..	..	..
" uterus	..	..	..	2	2	..	..	1	..	..	..	..	..	..	..	..	..	1	..	..	1	..	..	..	1	..	..	..	..	..	..
" leg	..	..	..	1	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Intussusception	..	..	..	..	3	..	..	..	1	..	..	..	..	..	..	..	..	1	..	..	1	..	..	..	..	..	..	..	..	..	..
Jaundice	1	..	1	7	2	1	..	..	..	2	..	..	2	1	..	..	..	..	..	..	1	..	..	..	2	..	..	..	..	1	..
Mania	..	..	..	4	3	..	..	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	1	1	1	..	..	2	..
Mania a potu	3	..	1	14	28	8	3	3	..	6	3	..	2	1	2	2	2	..	..	..	3	1	5	..	2	3	..	1	1	4	5
Marasmus	15	24	1	308	13	6	20	17	6	20	16	9	12	6	9	8	6	6	8	9	13	15	24	13	36	11	13	8	10	26	5
Measles	..	..	..	8	2	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	1	..	2	4	1	..	..	..	..	..	1
Old age	3	2	1	44	35	5	3	..	1	3	3	2	8	2	2	8	1	3	1	3	8	2	4	3	5	3	6	2	1	6	3
Neuralgia	..	..	..	2	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..
Palsy	3	2	2	37	27	3	4	3	4	1	5	..	1	..	1	6	1	..	4	5	1	3	2	2	5	2	4	4	1	5	1
Pyæmia	1	1	..	4	..	1	..	..	..	..	1	..	..	..	1	..	1	..	..	..	..	..	1	..	..	..	..	..	..	1	..
Rheumatism	..	2	1	9	2	1	..	..	1	2	..	..	..	..	1	1	..	..	1	..	..	..	1	1	..	1	..	..	2	..	..
Scrofula	3	2	1	40	3	5	4	3	3	2	..	1	1	2	..	1	3	4	..	2	3	2	1	2	3	1	1	..	1	6	1
Smallpox	..	4	..	46	1	..	5	1	..	6	1	1	1	3	4	1	..	1	..	..	..	1	16	..	3	2	..	..	1	..	..
Softening of the brain	..	..	..	3	3	..	1	..	2	..	..	..	1	..	..	..	..	..	1	..	..	..	..	..	1	..	..	..	..	..	..
Stricture of œsophagus	..	..	..	1	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Stillborn	1	10	1	346	..	1	23	14	16	27	12	13	19	11	6	17	13	17	5	11	16	16	12	8	19	14	1	4	12	10	30
Syphilis	3	..	1	4	..	1	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	..
Tabes mesenterica	1	2	..	17	..	1	1	3	1	2	1	..	2	..	..	..	2	..	..	..	..	..	2	..	1	..	..	1	..	1	1
Teething	..	1	..	24	..	..	1	..	1	..	..	1	3	..	..	1	1	..	1	..	3	..	3	..	3	1	2	..	1	1	1
Tetanus	1	1	1	3	7	2	2	..	..	..	1	..	..	..	1	..	..	..	1	..	..	..	..	..	1	2	..	..	..	1	2
Tumours	..	..	..	3	5	..	..	3	..	..	1	..	..	..	..	..	..	..	1	..	..	1	1	..	1	..	..	..	..	..	..
Ulceration	..	..	..	2	..	..	1	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
" of stomach & bowels	1	..	..	8	1	1	..	..	1	1	1	..	..	..	..	1	..	..	..	1	..	1	1	..	..	..	..	..	..	2	1
" throat	..	..	..	4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	1	1	..	..	..	1	..	..	..	..	..
Unknown	7	7	..	44	18	14	3	4	5	9	3	1	4	..	3	..	2	3	2	4	3	4	7	..	3	2	1	1	..	10	2
Worms	..	..	1	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..
Uræmia	..	..	..	2	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..
Total	256	306	131	4888	1096	358	448	332	237	385	232	150	358	190	182	214	182	156	123	195	283	194	307	217	452	261	122	147	187	433	224

TABLE VII.—*Classified Mortality for the year 1860.*

DISEASES.	JAN.		FEB.		MARCH.		APRIL.		MAY.		JUNE.		JULY.		AUGUST.		SEPT.		OCT.		NOV.		DEC.		TOTAL.
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	
CLASS I.—ZYMOTIC, EPIDEMIC, ENDEMIC, OR CONTAGIOUS.																									
Cholera	..	..	..	..	..	..	..	..	..	..	..	..	..	1	2	..	1	..	..	..	..	..	..	..	4
" infantum	..	..	..	..	..	..	..	..	4	2	25	27	110	100	92	92	33	18	8	1	1	1	..	..	514
" morbus	..	..	..	..	..	1	..	..	..	2	..	..	4	7	6	2	1	1	..	..	..	..	..	..	24
Diarrhœa	..	3	1	3	4	3	2	2	2	6	12	8	13	16	17	13	9	4	3	8	3	4	4	2	142
Diphtheria	..	..	4	10	9	13	8	9	9	14	7	10	8	6	16	19	14	12	27	33	21	19	19	20	307
Dysentery	3	..	4	2	1	..	5	1	4	1	10	9	22	22	30	24	12	14	7	3	1	1	1	1	178
Erysipelas	2	1	5	3	3	8	6	3	4	8	2	2	1	2	6	4	1	2	6	3	2	2	2	2	80
Fever	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	1
" bilious	..	..	..	1	..	..	1	..	..	..	..	1	1	3	2	..	1	..	..	1	..	..	1	..	12
" congestive	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	1	..	..	..	..	1	..	..	3
" continued	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
" gastric	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
" intermittent	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	1	..	1	..	..	..	5
" nervous	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	1	..	..	..	..	..	..	..	1	3
" remittent	..	..	1	..	1	2	1	..	2	2	2	..	..	..	..	..	1	..	..	..	4	..	..	2	18
" scarlet	21	8	22	19	18	19	16	19	13	24	20	7	11	15	18	9	17	28	52	51	37	45	58	44	591
" typhoid	6	11	9	6	7	6	7	10	3	12	11	9	7	6	15	14	11	10	11	4	17	10	8	3	213
" typhus	1	2	1	..	1	3	1	1	..	2	2	2	3	..	3	2	1	1	4	2	..	1	3	2	38
" " icterodes	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	1
Hooping-cough	2	5	6	4	2	3	3	2	5	3	..	2	1	3	2	3	2	3	1	..	..	1	1	1	55
Measles	1	..	1	..	..	2	..	..	..	1	..	..	..	..	3	2	..	..	2	..	..	2	1	..	15
Smallpox	1	..	2	1	..	..	1	..	1	1	2	1	1	..	..	2	..	1	6	5	9	4	6	13	57
Syphilis	..	1	..	..	1	..	..	..	1	1	..	..	..	..	1	1	..	..	..	1	..	1	..	1	9
Thrush or aphthæ	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	1	..	..	..	..	..	..	3
Total	38	32	56	49	47	60	51	47	49	80	93	79	182	181	214	190	107	96	128	112	96	92	104	92	2275
CLASS II.—UNCERTAIN OR GENERAL SEAT SPORADIC DISEASES.																									
Abscess	1	1	..	..	1	2	1	2	..	2	2	1	2	5	..	4	4	4	4	2	..	2	2	2	44
Anæmia	..	..	2	4	1	..	..	2	..	1	..	1	..	..	..	..	..	..	..	4	..	..	1	..	16
Cancer or scirrhus	..	2	..	4	..	2	4	5	2	6	2	1	..	..	2	2	2	2	3	5	3	5	1	1	54
" of breast	..	..	..	..	..	2	..	1	..	1	..	..	..	4	..	5	..	2	..	..	..	..	..	1	16
Cyanosis	5	..	3	1	2	5	3	2	2	2	1	1	3	3	4	3	2	2	..	1	2	3	2	..	52
Debility	21	15	24	16	18	17	23	16	23	20	17	20	28	26	31	33	20	16	29	29	18	21	33	24	538
Disease of throat	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	2
Dropsy	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	10	15	11	10	8	13	69

TABLE VII.—*Classified Mortality for the year* 1860—Continued.

DISEASES.	JAN.		FEB.		MARCH.		APRIL.		MAY.		JUNE.		JULY.		AUGUST.		SEPT.		OCT.		NOV.		DEC.		TOTAL.
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	
CLASS II.—UNCERTAIN OR GENERAL SEAT SPORADIC DISEASES—*continued.*																									
Gangrene	1	..	1	3	..	..	1	..	1	1	..	..	3	1	2	1	..	..	2	..	..	..	3	..	20
Gout	..	1	2	..	..	1	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	1	..	6
Hectic fever	..	..	..	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2
Hemorrhage	..	..	2	..	..	1	2	3	2	2	2	1	2	..	1	1	2	1	3	3	2	4	2	2	38
Inflammation of leg	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	1
" throat	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	..	..	..	..	..	..	1	4
Inanition	10	9	7	4	3	1	5	9	7	9	8	4	11	7	10	7	6	5	11	8	6	3	6	4	163
Marasmus	10	9	11	13	6	13	11	11	9	17	24	17	50	41	58	37	30	22	25	15	14	7	16	12	478
Malformation	..	..	..	1	..	..	..	..	..	..	1	..	..	..	..	1	..	..	..	..	..	..	..	..	3
Mortification	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2
Scrofula	4	1	4	1	..	4	3	..	1	..	3	2	6	5	9	3	3	1	2	3	5	3	7	1	71
Sore throat	1	7	5	5	2	1	3	2	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	27
Tabes mesenterica	..	..	3	1	..	..	1	..	2	1	..	..	2	2	3	..	6	1	2	..	..	1	..	1	26
Tumours	1	1	..	..	1	..	..	..	..	1	1	..	1	2	1	1	..	..	..	2	1	..	..	..	13
Ulceration	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	5
" of throat	..	..	..	1	1	..	..	..	..	..	..	..	..	..	1	..	..	..	1	..	2	..	..	..	6
Total	59	46	64	55	35	50	57	53	49	63	61	49	108	96	123	99	80	57	95	89	65	59	82	62	1656
CLASS III.—NERVOUS SYSTEM.																									
Apoplexy	6	4	5	12	5	3	5	..	10	5	4	3	6	4	12	3	6	4	10	7	9	3	6	11	143
Congestion of the brain	5	8	12	5	14	9	11	7	16	9	11	10	9	12	23	15	15	9	11	10	9	6	7	11	254
Convulsions	16	18	29	31	28	16	18	25	21	21	24	27	22	21	28	21	15	22	26	18	19	15	13	16	513
Coup de soleil	..	..	..	..	..	..	..	..	..	..	..	..	1	..	1	..	..	..	..	..	..	..	..	..	2
Disease of the brain	7	5	7	8	7	5	10	6	6	12	3	3	11	10	11	2	7	3	13	7	1	4	8	1	157
Dropsy of the brain	16	6	15	5	14	7	13	9	8	7	7	6	17	26	15	19	10	6	10	10	8	1	9	3	247
Effusion of the brain	..	2	1	9	4	4	5	1	1	3	5	5	3	2	6	8	2	2	2	6	1	..	3	1	76
Epilepsy	1	..	2	1	2	..	1	1	2	1	2	2	..	1	1	2	..	1	1	..	..	..	1	..	22
Inflammation of the brain	11	14	21	16	10	10	13	8	9	5	12	8	18	10	26	14	7	1	11	9	11	8	9	5	266
Mania	..	..	1	1	..	..	..	..	..	..	..	1	..	..	..	1	..	1	..	3	..	1	1	..	10
Mania à potu	8	1	2	1	11	3	10	5	9	5	10	2	6	4	6	1	5	1	12	..	3	3	5	4	117
Neuralgia	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	1	..	..	2
Palsy	5	8	8	5	4	4	7	4	4	3	7	4	6	6	6	5	4	3	8	7	9	6	2	5	130
Softening of the brain	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	1	2	..	6
Tetanus	1	2	..	3	1	..	2	..	..	..	..	..	..	1	3	1	4	1	2	..	..	..	..	..	21
Total	76	68	103	97	100	61	95	66	86	71	85	71	99	97	139	95	75	54	106	77	73	49	66	57	1966

TABLE VII.—*Classified Mortality for the year* 1860—Continued.

DISEASES.	JAN.		FEB.		MARCH.		APRIL.		MAY.		JUNE.		JULY.		AUGUST.		SEPT.		OCT.		NOV.		DEC.		TOTAL.
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	
CLASS IV.—DISEASES OF THE RESPIRATORY SYSTEM.																									
Asthma	1	1	2	3	2	1	1	1	2	2	..	3	1	..	1	2	1	..	3	..	..	..	2	3	32
Congestion of the lungs	7	4	13	9	6	4	12	2	5	11	5	4	4	1	7	3	1	5	3	8	3	2	6	4	129
Consumption of the lungs	59	60	96	80	69	70	59	64	72	90	56	55	64	56	77	88	56	59	66	78	45	61	66	76	1622
Croup	25	15	32	27	18	10	19	13	16	12	14	8	10	8	8	4	9	7	22	10	24	12	21	10	354
Disease of the lungs	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	1
" " chest	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1
Dropsy of the chest	6	8	4	12	8	3	9	6	8	10	6	7	11	10	14	7	4	3	4	2	1	1	1	3	148
Hemorrhage of the lungs	2	4	2	4	1	2	..	..	1	..	..	2	1	..	3	1	1	1	2	..	..	..	..	..	27
Inflammation of the bronchi	10	7	5	8	7	5	4	2	4	4	4	4	..	..	4	2	2	1	3	5	3	8	8	7	107
" " chest	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	1
" " larynx	1	3	2	2	5	2	3	1	3	4	..	1	..	..	1	1	..	..	2	1	2	2	2	..	38
" " lungs	37	34	36	28	22	13	28	20	35	23	16	19	8	17	14	12	16	11	27	20	13	7	16	30	502
" " pleura	..	1	3	1	..	..	..	2	..	1	1	..	..	..	1	..	..	..	..	..	2	..	1	..	13
Total	148	137	195	174	118	110	135	111	146	157	102	103	99	92	131	120	90	87	132	124	93	94	123	131	2975
CLASS V.—ORGANS OF CIRCULATION.																									
Aneurism	..	..	1	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	2	..	..	..	..	..	4
Disease of the heart	14	12	25	18	13	15	13	8	12	17	6	13	7	19	13	9	9	9	4	10	10	11	9	11	287
Dropsy of the heart	2	1	1	2	..	..	..	..	1	..	..	..	1	..	5	1	4	6	2	4	..	1	1	3	35
Enlargement of the heart	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	1	..	2	5
Inflammation of the heart	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	3	1	1	2	..	9
Pyohæmia	1	..	..	..	..	1	1	..	2	..	..	..	1	..	1	..	1	..	1	..	..	..	..	1	10
Total	17	13	27	20	13	16	14	8	15	17	6	13	9	20	19	10	15	16	9	17	13	14	12	17	350
CLASS VI.—DISEASES OF THE DIGESTIVE ORGANS.																									
Abscess of the liver	..	..	..	..	..	..	..	..	..	..	..	..	2	5	..	..	..	..	..	..	..	..	..	..	7
Cancer of the stomach and bowels	1	..	..	..	1	3	..	..	..	2	..	..	1	4	6	2	2	2	..	..	..	1	4	..	29
" liver	..	..	..	1	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	1	..	4
Cirrhosis	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	1	1	1	5
Colic	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	1
Congestion of the liver	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1
Disease of the liver	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4	1	1	..	..	..	1	..	..	..	7
" " spleen	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	1

TABLE VII.—*Classified Mortality for the year* 1860—Continued.

DISEASES.	JAN.		FEB.		MARCH.		APRIL.		MAY.		JUNE.		JULY.		AUGUST.		SEPT.		OCT.		NOV.		DEC.		TOTAL.
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	
CLASS VI.—DISEASES OF THE DIGESTIVE ORGANS—*continued.*																									
Dyspepsia	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	1	4
Hemorrhage of the stomach and bowels	..	..	..	1	1	..	..	..	1	..	..	1	..	..	..	..	..	..	1	1	..	..	..	1	7
Hernia	..	2	..	1	..	1	1	..	1	..	..	..	3	2	..	1	1	..	1	1	..	..	1	1	17
Inflammation of the stomach and bowels	9	4	7	10	6	10	13	11	12	10	14	8	18	13	22	17	12	11	10	19	11	10	14	8	279
" " peritoneum	1	1	..	1	1	3	..	..	1	2	3	1	9	2	3	6	4	3	5	1	..	4	4	8	63
" " liver	3	1	4	5	5	3	3	4	2	3	5	2	3	5	2	3	2	2	3	6	4	..	2	1	73
Intussusception	..	1	..	..	..	..	2	..	..	..	..	..	..	..	1	..	..	..	..	..	1	..	1	..	6
Jaundice	1	1	..	..	..	..	..	..	2	3	..	..	1	..	2	..	..	2	1	1	2	..	..	1	17
Teething	1	1	2	1	1	..	..	..	2	..	5	2	3	3	5	4	1	1	..	1	3	..	1	2	39
Ulceration of the stomach and bowels	1	..	1	..	1	..	1	..	..	3	1	1	..	..	2	3	..	1	1	..	2	1	..	..	19
Worms	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	1	..	..	..	..	..	1	..	..	3
Total	17	11	14	20	16	22	20	16	21	23	28	15	42	34	47	39	24	23	22	30	25	18	30	25	582
CLASS VII.—DISEASES OF THE URINARY SYSTEM.																									
Albuminuria	1	..	..	..	..	..	1	1	..	..	..	..	..	1	1	..	3	..	..	..	..	..	..	1	9
Diabetes	1	..	1	..	..	..	..	..	..	..	..	1	2	..	..	1	..	..	4	..	..	..	1	..	11
Disease of the kidneys	2	1	2	..	1	1	3	2	1	..	1	..	3	3	4	2	1	4	3	2	2	2	3	..	43
Inflammation of the kidneys	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	2	1	4
" " bladder	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	4	1	..	2	2	..	..	..	..	11
Uræmia	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	1	..	..	2
Total	4	1	3	..	1	1	4	3	1	..	1	1	5	4	7	7	6	4	9	4	3	3	6	2	80
CLASS VIII.—DISEASES OF THE ORGANS OF GENERATION.																									
Cancer of the uterus	..	6	..	6	..	8	..	..	..	5	..	3	..	3	..	3	..	1	..	4	..	1	..	1	41
Hemorrhage of the uterus	..	..	..	3	..	..	..	1	..	..	..	..	..	..	..	1	..	..	..	2	..	..	..	1	8
Inflammation of the uterus	..	..	..	1	..	1	..	1	..	3	..	1	..	1	..	..	..	1	..	..	..	..	..	2	11
Puerperal fever	..	7	..	11	..	4	..	3	..	7	..	3	..	1	..	4	..	1	..	1	..	..	..	5	47
" convulsions	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	3	..	..	4
Ulceration of the uterus	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
Total	..	13	..	21	..	13	..	6	..	15	..	7	..	5	..	8	..	3	..	8	..	4	..	9	112

TABLE VII.—*Classified Mortality for the year* 1860—Continued.

DISEASES.	JAN.		FEB.		MARCH.		APRIL.		MAY.		JUNE.		JULY.		AUGUST.		SEPT.		OCT.		NOV.		DEC.		TOTAL.
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	
CLASS IX.—DISEASES OF ORGANS OF LOCOMOTION.																									
Caries	..	..	..	..	..	..	..	..	..	1	..	..	1	..	..	..	2	..	..	..	..	..	..	..	4
Disease of the spine	..	5	2	1	3	..	1	1	4	..	1	1	..	..	1	..	..	..	..	3	1	..	..	2	26
Inflammation of the hip	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	1	3
Rheumatism	1	1	1	..	..	..	1	1	1	..	3	1	1	2	..	..	..	1	1	1	1	..	3	2	22
Total	1	6	3	1	3	..	2	2	5	1	4	2	2	2	1	..	2	1	1	4	2	..	5	5	55
CLASS X.—DISEASES OF INTEGUMENTARY SYSTEM.																									
Eczema	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1
Elephantiasis	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	1
Total	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	2
CLASS XI.—OLD AGE. Total	5	19	18	24	7	11	7	8	8	12	7	7	5	11	8	11	4	7	1	5	5	12	5	10	213
CLASS XII.—FROM EXTERNAL CAUSES.																									
Asphyxia	..	..	..	1	..	1	1	..	1	2	1	1	2	2	..	1	1	1	3	2	1	2	3	..	26
Burns and scalds	7	4	4	4	3	5	1	5	3	4	..	1	2	2	..	1	2	4	1	8	4	6	2	4	77
Casualties	6	..	9	3	7	1	5	..	13	4	8	3	16	3	13	4	12	..	25	1	5	3	4	2	147
Drowned	..	1	2	2	3	..	5	..	19	..	18	1	13	1	35	3	7	1	9	..	3	1	3	1	128
Exposure	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4	..	..	4
Fracture	1	..	1	1	..	1	1	..	..	1	..	..	..	1	1	..	1	1	1	..	1	..	2	..	14
Poisoning	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	1	..	1	1	4
Suicide	2	1	..	..	1	..	..	..	3	..	1	1	2	..	1	..	..	..	1	..	5	..	1	1	20
Violence	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	2	..	1	..	4
Want and neglect	1	..	1	2	..	1	1	1	..	..	..	..	2	4	1	2	..	2	1	1	..	1	1	..	22
Strangulation	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	1
Total	17	6	17	13	14	9	14	6	39	11	29	7	37	13	51	12	24	9	41	12	22	17	18	9	447
CLASS XIII.—UNKNOWN. Total	4	4	7	6	9	4	5	1	3	6	4	5	5	5	14	8	9	5	7	10	5	2	5	1	134
CLASS XIV.—STILLBORN. Total	28	27	41	39	26	25	27	24	37	35	33	30	25	23	30	26	36	18	37	31	40	19	40	22	719

TABLE VIII.—*Mortality in each Ward, with the Population, according to the late Census, with the ratio of Deaths to Population, and the Percentage of Deaths in each Ward to the Total Mortality.*

WARDS.	Population last census.	Deaths.	Deaths to population.	Per cent. of deaths to total mortality.
First	37,078	448	1 in 83	7.07
Second . . .	23,097	332	1 " 69	5.23
Third	19,976	237	1 " 84	3.71
Fourth . . .	23,633	385	1 " 61	6.06
Fifth	24,858	232	1 " 107	3.65
Sixth	14,928	150	1 " 99	2.36
Seventh . . .	31,397	358	1 " 87	5.64
Eighth . . .	27,811	190	1 " 146	3.
Ninth	17,215	182	1 " 94	3.
Tenth	21,967	214	1 " 102	3.37
Eleventh . . .	16,717	182	1 " 92	3.
Twelfth . . .	16,811	156	1 " 107	2.45
Thirteenth . .	20,132	123	1 " 163	2.
Fourteenth . .	24,336	195	1 " 124	3.
Fifteenth . . .	32,431	283	1 " 114	4.46
Sixteenth . . .	20,092	194	1 " 103	3.
Seventeenth . .	23,328	307	1 " 76	4.84
Eighteenth . .	20,470	217	1 " 93	3.42
Nineteenth . .	39,271	452	1 " 87	7.12
Twentieth . .	30,152	261	1 " 115	4.04
Twenty-first . .	17,164	122	1 " 140	2.
Twenty-second .	17,286	147	1 " 117	2.31
Twenty-third .	24,093	187	1 " 129	3.
Twenty-fourth .	23,791	190	1 " 125	3.
Unknown . . .	......	224	......	......
Almshouse . .	......	243	......	......
From the country	......	131	......	......
Total for 6 mos.	......	6,342		
Total population	568,034			
Total mortality for the year		11,568		
Ratio of deaths to population		......	1 in 51	

FISKE FUND PRIZE ESSAY.

ART. IX.—*On "The Morbid Effects of the Retention in the Blood of the Elements of the Urinary Secretion."* By WM. W. MORLAND, M. D. (Continued from April No. p. 460.)

RHEUMATISM.—Nearly related to gout is the disease known by the term *rheumatism;* an affection which, like its *congener*, may be *acute* or *chronic*, and is characterized by very similar constitutional symptoms and by many local phenomena of like nature, while yet there are several striking points of difference. Thus, we observe indications of irritative action and of inflammatory states of variable severity; fever, anxiety, restlessness, chills, with full, quick and sharp pulse; gastric and intestinal disturbances; thirst, white tongue, foul breath, and acid eructations. Locally, there is heat, pain, and tense, or sometimes doughy, shining redness, with swelling around certain joints, and often affecting neighbouring tissues, as the muscles, tendons, &c. By preference, the larger joints are attacked in contradistinction to gout, which, as we have seen, fixes upon the smaller. There is also the remarkable and very distinctive symptom, or rather local manifestation, of *acid perspiration*, often very profuse and offensive. The latter is apparently the corresponding fact, so to speak, to the local appearance of urate of soda in the tophaceous deposits in gout; for, in true rheumatism, nothing of the sort occurs; in *rheumatic gout*, as will be seen, there is an analogous deposit.

From what we have already indicated, it is not difficult to see a great resemblance between gout and rheumatism; they have indeed been denominated "*first cousins.*" The first and most important question for us, concerning rheumatism, is—and it is an inquiry of great practical interest—*does it depend upon excess of uric acid in the blood, and its retention therein?*

The latest views of the pathology of the disease seem to give a directly *affirmative* answer to this question; and, of course, under this aspect of the subject, it devolves upon us to enumerate the affection and its results amongst those "morbid effects" of retention in the blood of the urinary "element" we are now examining. It should, however, be distinctly premised, that many researches and much close study and observation are yet required in order to enable us positively to declare uric acid or any of its products to be the *materies morbi* in rheumatism. Observers, however, at the present day, at least begin to speak with more confidence and decision upon this point. In the first place, we find it more than ever common for systematic writers on medicine to consider gout and rheumatism under one head; often in one chapter. Next, if we examine the language employed in discussing the yet unsettled question as to the *essential cause* of the disease, we shall observe a tone of much greater decision than in the works published only a comparatively short time since; while the matter is yet left open to doubt—most authorities not fully compromising themselves. We will refer to a few of these opinions. Dr. Barlow (*Manual of the Practice of Medicine*, 1856) says:—

> "The external cause [of rheumatism] is generally exposure to cold, especially when producing repressed perspiration. Its internal or essential cause seems to be an abnormal condition of the blood, which contains always an excess of fibrin and of uric acid: the latter is probably the *materies morbi* or peccant matter." (p. 130, *op. cit.*)

Dr. Bennett (*Clinical Lectures on the Principles and Practice of Medicine,* American edition, 1858) begins his remarks upon the General Pathology of Rheumatism and Gout, as follows:—

> "The present theory with regard to these affections is, that they are both connected with an increase of lithic acid in the blood. In rheumatism, this is dependent on excess of the secondary, and in gout on excess of the primary digestion." (*Op. cit.*, p. 909.)

The latter author also refers to the fact that a considerable amount of *lactic acid* is excreted from the skin, as was taught by Prout, and mentioned by Todd, Watson, and others of note, who have carefully studied the subject. Hitherto, the tendency seems rather to have been to ascribe the morbid phenomena of rheumatism to an excess of the last named acid in the system. Dr. Prout, in the fifth edition of his celebrated work on *Stomach and Renal Diseases*, refers pointedly to this explanation, as being his own belief. While mentioning in a foot-note (p. 549) the opinions of Dr. Garrod as to the relations of uric acid to gout and rheumatism, he says: "In various parts of this work I have spoken of lithic acid as being characteristic of gout, and the lactic acid of rheumatism. At any rate, I agree with Dr. G. that lithic acid has little to do with pure rheumatism; though it is often present in what is called rheumatic gout." In the latter affection—which is understood to be that variety of gout which attacks all the joints, indiscriminately, and for which Dr. Todd prefers the name of "*general gout*"—it is natural to believe that the chief morbific agency is uric acid, or a salt from it. It has, however, as we previously stated, until somewhat recently, been the persuasion of the majority of observers that lactic acid held that relation to rheumatism, which it seemed plausible to assign to uric acid in reference to gout. In his last edition (1857), Dr. Watson says, in the course of a remarkably clear and accurate *resumé* of the distinctions existing between gout and rheumatism (*op. cit.*, vol. ii. p. 761, English edition): "Gout is often, rheumatism is never, associated with chalk-stones; and conformably with this distinction, Dr. Garrod has taught us that uric acid in excess is present in the blood of the gouty, and not present in that of rheumatic patients."[1]

The manner in which Dr. Todd (*op. sup. cit.*) refers to the method pointed out by Dr. Garrod for detecting uric acid in the serum of the blood, in gouty cases, seems decidedly indicative of his own views as respects the existence of uric acid in excess in the blood in gout and not in rheumatism; and in this connection, we are glad of an opportunity to give the method of Dr. Garrod, above referred to. Dr. Todd says:—

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[1] Speaking of Dr. Prout's belief in regard to the *lithic* and *lactic acids*, and their relations to gout and rheumatism, Dr. Watson relates certain experiments, by Dr. Richardson, upon animals. Lactic acid introduced into the peritoneal cavity of a healthy cat, produced irregular cardiac action in two hours. The animal was found dead the next morning, and no peritoneal inflammation was discovered, but "marked endocarditis of the left chambers of the heart. The mitral valve was inflamed and thickened, and covered on its free borders with firm fibrinous deposits. The whole inner surface of the ventricle was highly vascular." Similar results were observed in a dog experimented upon in like manner. No textural alterations were found in the joints.

> "Dr. Garrod has made out a positive physical character of gout, which may be regarded as surely diagnostic of that disease from rheumatism. It consists in the discovery of uric acid in the blood-serum or the blister-serum. And his process is ingenious, and so simple that any one may use the test, however little accustomed to chemical manipulation. A little serum is put into a watch-glass, and to it are added five or ten drops of acetic acid. In this acidulated serum a small skein of worsted is laid, and the watch-glass is set aside under cover to protect it from dust. After a few hours, the crystals of lithic acid, if it exist, will be found adhering to the threads."[1] (*Op. cit.*, pp. 408–9.)

Dr. Henry William Fuller, of London, Assistant Physician to St. George's Hospital, in his very scientific and able treatise on *Rheumatism, Rheumatic Gout, and Sciatica*, published in 1852, takes the ground that *lactic acid* is the *materies morbi* in rheumatism. He thus falls in with the opinions of Drs. Prout, Todd, Williams, and others, who so believed, although not positively asserting the fact as indisputable. Dr. Fuller considers the cause of the disease to be a poison in the blood, and which is generated in the system as the product of a peculiar form of mal-assimilation—of vicious metamorphic action. This poison it is "which excites the fever, and produces all the pains and local inflammations which are often found associated in an attack of rheumatism." (*Op. cit.*, p. 28.) He then points out the fact that although the fever may be increased by the occurrence of the local inflammations, "it is essentially independent of them," and often is well developed before they begin. If the virus is in small quantity in the blood, then only slight wandering pains are produced; if in large quantities, and increasing, the effects are usually proportionate. Some constitutions, of course, manifest more resistance than others.

We have previously cited the authority of Dr. Garrod in reference to the morbific agency in gout and rheumatism; and in his late work,[2] we find him reiterating his views, and pronouncing the urate of soda "*pathognomonic*" of gout. Some of this author's conclusions thus lately arrived at, or rather confirmed—for such, we believe, has always been his doctrine—are so positive and so much to the point for our present purpose, that we quote them. His analyses show that "healthy blood contains the merest trace of uric acid or urea, so small as to be in general undiscoverable, except by the most minute and searching chemical examination, and not always then.

> "That, in gout, the blood is invariably rich in uric acid, which exists in the state of urate of soda, and can be separated from it, either in the form of the crystalline salt in acicular needles, or as rhombic crystals of uric acid.
>
> "That, in acute rheumatism, the blood is free from uric acid, or, at least, contains no more than in health.
>
> "That the perspiration seldom contains uric acid; but that, in gout, oxalate of lime may be crystallized from it, as also from the blood."[3]

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[1] In Dr. Garrod's late work (*Gout and Rheumatic Gout*) we find this process much more elaborately described. See pages 110–113, *op. cit.*

[2] "The Nature and Treatment of Gout and Rheumatic Gout."

[3] In giving these opinions of Dr. Garrod, we followed the statement furnished in the *Lancet* of December 24th, 1859, not then having seen Dr. G.'s work. The account is by the Reviewer, condensed from the book itself. We have lately, however, had the volume at our disposal, and can testify that it is a most satisfactory, complete, and erudite treatise.

In the above expressions of opinion, founded on careful analysis, we find Dr. Garrod distinctly declaring that the blood is free from uric acid, or only contains a normal amount thereof; he therefore does not consider that acid the cause of rheumatism.

Such are some of the opinions to which we referred; and while, in view of the existing difference in the decisions of equally eminent men upon this point, we cannot look upon the pathology of rheumatism as by any means definitively settled, it seemingly devolves upon us to consider the disease as a condition referable to excess of uric acid in the system, in deference at least to the opinion of many of the latest observers, whose position, judgment, and opportunities for the accumulation and weighing of evidence are such as to entitle their announcements to the greatest respect. In this regard, however, as much can be said for those who hold the opposite views, or who do not fully compromise themselves; but we shall be quite safe, at least, in discussing the question according to the plan above announced. Our own conviction, hitherto, has always been wholly in favour of the *lactic acid* theory; and, within a day or two, having put the question to a highly-cultivated and well-informed medical friend—"What do you consider the *materies morbi* in rheumatism to be?" his reply was, after a few moments' consideration, "Some product of *lactic acid*—some of the lactates."

Whatever the fact may be, it is clear that the fault of *deficient excretion* is equally active in rheumatism as in gout; the former is as distinctly a blood-disease as the latter.[1] The deranged excretory function ("Uric-acid-excreting"), however, chooses a different field for the manifestation of its disorder or impairment; the disarranged balance between the excess of acid and the excreting power being as evident in one as in the other. Dr. Bennett (*op. cit.*) writes very clearly and comprehensively on this point. He remarks: "In both diseases there is an undue balance between the excess of lithic acid and the power of excretion—in rheumatism by the skin, and in gout by the kidney. This pathology serves to explain the similitudes and differences existing between the two affections. In both there is a certain constitutional state dependent on deranged digestion, during which, exciting causes occasion local effects."

He then signalizes the fact that in rheumatism the *exciting* causes are those of a depressing nature, and are usually exerted upon the poorer classes. The chief provocatives of rheumatism, as is well known, being cold and wet, bad and insufficient food, and hard labour. As we have already set forth, precisely the opposite immediate causative elements are active in gout, *i. e.*, luxurious and intemperate diet, indolence and self-indulgence of all kinds. Dr. Fuller's idea—and which is, doubtless, that of every reflecting and intelligent practitioner—is, that the morbid material acting in the blood, is often, if not nearly always, the *sole* cause of rheumatism—secondary or exciting causes not coming at all into play, or proving ineffective, if brought to bear on the system. They are only promotive agencies, not causative elements.

It will not be expected of us, we conclude, specially to detail the course of rheumatic fever, or of chronic rheumatism. Indeed, with the present undetermined state of the pathology of the disease, we might perhaps have deemed it justifiable to withdraw the disease from the category of the "morbid effects" of retention of an element of the urinary secretion in the blood. It could hardly, however, be other than an omission of some moment, had we not carefully examined the present belief on the subject; and, having done this with considerable research, we place in due order the names of all the authors of most eminence in regard to the subject, within the last few years, whose works we have been able to consult. Their opinions are expressed with more or less positiveness; some only implying their belief, others boldly asserting it.

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[1] "In truth, acute rheumatism is a blood-disease. The circulating blood carries with it a poisonous material, which, by virtue of some mutual or elective affinity, falls upon the fibrous tissues in particular, visiting and quitting them with a variableness that resembles caprice, but is ruled, no doubt, by definite laws, to us, as yet, unknown." (Watson, *Practice of Medicine*, vol. ii. pp. 738–9.)

What is the Materies Morbi in Rheumatism?

LACTIC ACID.		URIC ACID.	
Dr. Prout	(1848.)	Dr. Barlow	(1856.)
" Fuller	(1852.)	" J. H. Bennett	(1858.)
" Todd	(1857.)	" Copland	(1858.)
" Watson	(1857.)	" Thudichum	(1858.)[1]

With respect to Drs. Thudichum and Golding Bird—the latter of whom might have been ranged with the former in the above table—their opinions are inferred from expressions in their works, such as we quote in a footnote.[2]

It may here be added that Dr. Prout intimates it to be a very supposable and plausible doctrine that the phenomena of rheumatic gout—which, by the way, both he and others pronounce very difficult to relieve—may be explained by the fact of the concurrent action of both lactic and lithic acid in the system. This form or combination of disease requires to be described more at length, as being less familiar than rheumatism, and presenting more novel points for inquiry.

RHEUMATIC GOUT.—We have already referred to this affection, which presents a singular combination of the characteristics of rheumatism and gout. Without resembling either, as a whole, it partakes, seemingly, of the nature of both. Unlike gout in general, it attacks the weakly individual as well as the strong, and quite as readily; or else those who are robust, when either physically or mentally depressed. In this malady the analogy of the two diseases is most apparent; or rather, their dependence upon a similar cause is perhaps most clearly seen. We observe, however, that Dr. Garrod, in his work just published,[1] does not incline to the idea that this affection is actually a combination of gout and rheumatism. He prefers, moreover, to employ the term "*Rheumatoid Arthritis*," and remarks: "If we agree to name a disease simply from its external characters, then I admit that the term rheumatic gout is not inappropriate; but if we advance further, and have regard to more intimate pathology, then I deny the propriety of the name: acting upon the former principle, we should be equally justified in calling some cases of scarlatina or measles by the compound term of rubeolo-scarlatina, and we know that these diseases were not separated two centuries ago * *." "Although unwilling to add to the number of names, I cannot help expressing a desire that one might be found for this disease, not implying any necessary connection between it and either gout or rheumatism. Perhaps *Rheumatoid Arthritis* would answer the object, by which term I should wish to imply an inflammatory affection of the joints, not unlike rheumatism in some of its characters, but differing materially from it." (*Op. cit.*, pp. 533–4.) Dr. Garrod also refers to the fact that but few authors recognize any existing combination of gout and rheumatism, many even strongly oppose such a doctrine. He mentions Boerhaave, Van Swieten, Cullen, Heberden, and Watson, as not alluding to such a connection or fusion, and quotes Sir C. Scudamore, as saying "that the textures which have been long affected with gout, become so much weakened as to be very susceptible to vicissitudes of temperature; and in this way the general disorder may partake of rheumatism. It was only thus that he could attach any propriety to the very common expression *rheumatic gout*. It would appear that the term is often made use of, but seldom attempted to be defined with precision." (*Op. cit.*, p. 527.)

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[1] Dr. Garrod might, by inference, be placed in the left-hand column; since, although he does not, so far as we have been able to ascertain, say that rheumatism depends on the presence of an excess of *lactic* acid in the blood, he demonstrates the absence of *uric* acid in the cases he has examined, and evidently does not consider it, in any wise, dependent thereon. (See his late work on *The Nature and Treatment of Gout and Rheumatic Gout.*)

[2] "In the two allied affections, gout and rheumatism, exclusive of the many neuralgic diseases popularly referred to the latter, a remarkable tendency to the formation of an excess of uric acid, both pure and combined, occurs." G. Bird, *Urinary Deposits*, English edition, by E. Lloyd Birkett, M. D., 1857, p. 150.

"As a question clearly put is half the answer, we may be permitted here to consider what proximate conditions of the system a rise or fall in the quantity of uric acid beyond the normal limits is likely to indicate. A deficiency may be due to a diminished production in the system, as in anæmia, or to retention, as in certain stages of gout and rheumatism. It is at least questionable whether the retention is *always* due to diseased action of the kidney. Any disease, however, which interferes with the secreting power of the kidney by changing its structure, such as Bright's disease, is certain to cause retention of uric acid in the blood, in proportion to the retention of the other constituents of urine. (Scarlatina seems to make an exception. * *.") Thudichum, *op. cit.*, p. 95.

The affection has been known by various names. Thus Dr. Haygarth styled it "*Nodosity of the Joints;*" Cruveilhier, "*Usure des Cartilages Articulaires;*" Dr. Adams, of Dublin, "*Chronic Rheumatic Arthritis.*" Dr. Garrod, who mentions the above designations, also says: "It has sometimes received a name dependent on its situation; for example, rheumatic gout, when the wrists, hands, and feet are affected; chronic rheumatism, when in the shoulder, elbow, or knee, either singly or simultaneously; and *morbus coxæ senilis*, when located in the hip. Occasionally it assumes an acute, or rather subacute, character, but more generally it is chronic throughout." (p. 533.)

Neither *sex* nor *condition* in life seems to have any influence in procuring immunity from this disease. According to Dr. Adams, the hip-joint is most often affected in males; in females, the wrists and hands. He found it more prevalent amongst the poor and labouring classes; Sir Benjamin Brodie considers it most common in the higher classes. This diversity of opinion, Dr. Garrod explains by referring it to the "difference in the class of cases more prominently brought under each surgeon's notice." (*Op. cit.*, pp. 534–5.)

The *main characteristics* of the disease may be grouped as follows: Pain, of a migratory nature, and which is often very severe and obstinate.

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[1] The Nature and Treatment of Gout and Rheumatic Gout. By Alfred Baring Garrod, M. D., F. R. S., Fellow of the Royal College of Physicians, Physician to University College Hospital, etc. etc.; London, Walton and Maberly, 1859.

It is sometimes aggravated at night, and also by heat. (Garrod.) Motion is extremely painful to an affected joint, especially after prolonged rest. There is notable frequency of recurrence, and predilection for the smaller joints. The joints attacked become, after a time, swollen; fluid is effused in considerable quantities into the cavities of the joints, and fluctuation is often perceptible. The ratio of helplessness is, of course, in relation with the number of joints crippled; generally, none of the articulations escape, when once any of them have been invaded. There is usually but little accompanying febrile excitement and constitutional sympathy; although this depends, very distinctly, upon the number of joints attacked; that is, upon the extent, or degree of universality of the disease. (*Auct. cit. et al.*)

Complications.—Cerebritis, pleuritis, inflammation of the eye. The latter is comparatively rare; all the ocular tissues may be affected; generally, however, if the patient have treatment, the choroid coat and the iris escape. Exhausted and shattered constitutions are those most obnoxious to ocular inflammation in connection with rheumatic gout. (Fuller.)

Results.—Thickening and permanent enlargement of the structures forming, and (less frequently) of those surrounding the joints; occasionally, there is cuticular desquamation, as in gouty cases. In the chronic form, which, as we have stated, is most commonly observed, the articular cartilages are affected, the ligaments about the joints are stretched, and the ends of the bones are irregularly enlarged. The synovia subsequently becomes absorbed, and the capsular membrane is left much thickened. The *ligamentum teres* of the hip, and the tendon of the biceps are sometimes destroyed, and even completely removed. Not only the articular, but the inter-articular cartilages are absorbed; this is observed in the knee-joint, the wrist and the lower jaw. (Garrod.) When the disease has been very prolonged and severe, the synovial membrane becomes not only thickened, but droops into the articular cavity; or, as Dr. Fuller points out, "a dense, ligamentous substance, resulting probably from some peculiar alteration in the synovial membrane, is seen interposed between the articulating surfaces; or small irregularly shaped cartilaginous bodies are found, either loose within the joint, or attached to it by pedicles formed of thickened synovial membrane." Sometimes these excrescences are bony; and others of a vascular nature likewise exist. (Garrod, *op. cit.*) The opposite surfaces of the bones forming the joints, being denuded by chronic wasting of the cartilages, and rendered smooth by attrition upon each other, are found to be white, glistening, and ivory-like in appearance.[1] The latter condition, we conclude, is that observed in what is termed "dry chronic arthritis"—*Arthrite chronique sêche* of the French writers. We have had the opportunity of witnessing this alteration in several instances; the state is that known as *eburnation.* In specimens which we have seen, the change of texture was chiefly marked in the track of the *greatest attrition,* in the affected joint; a fact noticed particularly by Dr. Garrod. (*Op. cit.*)

> "The denuded surfaces become partly worn away, and a smooth enamel is formed by the mutual action of the bones on each other, and around the articular surfaces thus acted upon bony vegetations arise.
>
> "In most joints, after the fluid has become absorbed, a crepitus is felt on movement from the rough surfaces grating against each other." (p. 540.)

There is, in certain instances, a pulverulent deposit, usually consisting of lithate of soda, but containing also, at times, lithate of potash, ammonia and lime, chloride of sodium, phosphate and carbonate of lime. This lightly incrusts either the entire surfaces of the affected joints, or only portions thereof; and it may pervade their solid structures.

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[1] Fuller.

Although this deposit is identical, or nearly so, with that of gout, and occurs alone in those cases of rheumatic gout most nearly resembling genuine gout, yet, says Dr. Fuller, "I cannot therefore admit the conclusion that the existence of such deposit is of itself sufficient to mark such cases as examples of true gout." (p. 331.) The reasons he assigns for this opinion are, briefly: 1. The occurrence of these cases in "thin, spare persons of temperate habits," who have had rheumatic rather than gouty symptoms; 2. The difference in form and situation from the chalk-stone deposit of true gout; 3. The disease occurs, often, in those who formerly have had pure uncombined rheumatism; and these persons sometimes exhibit the well-known external traces of that disease. This author distinctly avows his belief that rheumatic gout is a true combination of the two diseases whence it derives its name; and when, on dissection, one joint is found to present most evidence of the gouty, and another most of a rheumatic element having been at work, he explains this by supposing that more of one influence was in force during the time such a joint was affected; and the other result rests upon similar action from the opposite influence. Dr. Garrod, who, as we have already stated, does not consider the affection to be a compound of gout and rheumatism, admits, notwithstanding, its greater resemblance to rheumatism than to gout; but he believes that much harm has been done practically, by confounding it with either gout or rheumatism.[1]

Such, then, are the principal results—if we adopt the theory received, as we have seen, by so many reliable observers, viz., that rheumatism depends on retention of uric acid in the blood—of this poisoning of the blood by the undue presence of the *materies morbi* in the system; and both in this and the previously considered affection (gout) we have a series of symptoms indicative of the great extent to which the infection of the blood sometimes attains; and also ocular evidence, both during life and after death, of the power and virulence of the poison.[2]

We have not treated of the occurrence of *metastasis* of rheumatism under a separate head, because the chief danger in this light is of the *heart* being affected, and we have already pointed out the frequency of such attacks, and the necroscopic phenomena. Sufficient allusion, we believe, has also been made to the occasional transfer of the affection to other organs. The *sequelæ* of the disease have likewise been incidentally mentioned under the head of *results* and *consequent diseases*. It is, however, not supererogatory again to refer pointedly to the extreme danger which environs those who, during rheumatic fever, have also had heart disease. Such persons, even if apparently entirely recovered, *are never to be considered out of danger*, and they require, of course, due warning from their physicians, and the exercise of great discretion on their own part, in order that they may be fully aware of their insecurity, and able, so far as is possible, to guard against a return or re-awakening of their formidable malady.

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[1] We take this opportunity to refer those interested in these subjects, to the elaborate and interesting treatise of Dr. Garrod, which we have designated above. The differential diagnosis of gout and rheumatism is clearly set forth, and the work is fully illustrated by tables, plates, etc.

[2] It should be stated that the testes, as well as the skin, periosteum and aponeuroses are occasionally affected, either concomitantly and acutely, or subsequently and in a more chronic manner. Dr. Fuller and others have enlarged upon the predilection of rheumatism for "the white fibrous tissue." The former author refers to the mention by Dr. Watson, of rheumatism of the articulation of the jaw, and also of that of the membranes of the spinal cord by Dr. Copland and others. (*Op. cit.*, p. 46.) We need hardly refer to the fact of the frequent association of rheumatismal attacks—in predisposed subjects—with gonorrhœa.

We have thus endeavoured to present the chief phenomena, resulting directly and also secondarily from retention of uric acid in the blood. Whilst the manifestations of *gout* and *rheumatism* have been, of necessity, prominent, the reader will not have failed to remark the lengthy list of antecedent, concomitant, and subsequent, ailments, seemingly more or less dependent upon that morbid influence which, by common consent, is allowed to be the active promoter, and, we may say, the originator of the disease. From the slighter derangements of the general health, through all the phases of dyspeptical disorder, to the agonizing paroxysms of gout and rheumatism, their *sequelæ*, exceedingly dangerous metastases and disastrous ravages upon the external form, both as to appearance and freedom of motion; and finally in the *post-mortem* evidences of its activity, do we not seem to recognize the presence and morbid power of that "element of the urinary secretion" we have been considering, prevented as it is in such cases from obtaining an exit through its natural excretory channels?

CREATINE AND CREATININE.—*Formulæ:* Creatine, $C_8H_9N_3O_4+2$ Aq. —Creatinine, $C_8H_7N_3O_2$.—[1]

Creatine.—This substance, discovered by Chevreul, in 1835, is crystallizable, and is derived from the juice of flesh. It is stated to be "present

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[1] Thudichum.

Chemical Composition of Creatine and Creatinine.

Creatine:	8 equivalents of carbon . . .	48	36.64
	3 " " nitrogen . . .	42	32.06
	9 " " hydrogen . . .	9	6.87
	4 " " oxygen . . .	32	24.43
	Atomic weight of dry creatine	131	100.00

To procure the formula for "crystallized creatine,"

Take, 1 atom of dry creatine . . .	131	87.92
and 2 atoms of water	18	12.08
	149	100.00

Thudichum.

$C_8,N_3,H_9,O_4,+2HO=131+18=149.$ *G. Bird.*

$C_8,H_{11},N_3,O_6.$ *G. Johnson.*

Creatinine:	8 equivalents of carbon . . .	48	42.48
	7 " " hydrogen . . .	7	6.19
	3 " " nitrogen . . .	42	37.17
	2 " " oxygen . . .	16	14.16
	Atomic weight of creatinine	113	100.00

Thudichum.

$C_8,N_3,H_7,O_2,=113.$ *G. Bird.*

$C_8,H_7,N_3,O_2.$ *G. Johnson.*

The formula expresses "crystallized" creatinine.

in the blood and urine of man and of all animals hitherto examined." (Thudichum, *op. cit.*) Both this substance and creatinine, in the form of chloride-of-zinc salt, were found in the urine by Heintz and Pettenkofer, simultaneously, in 1844; but these chemists did not then recognize their identity with the above-mentioned product of the juice of flesh. Liebig, in 1847, demonstrated both creatine and creatinine to be "constant ingredients of the juices of the flesh of nearly all the classes of vertebrate animals, and of the urine of man." (*Idem.*)

Although now a recognized element of the urine, creatine is contained therein in an exceedingly minute proportion. It is always present in the blood, which is a fact important to note in respect to our present inquiry; for, if naturally existing in the vital fluid as a product of a chemical muscular change or waste, it is doubtless innocuous so long as it is finally discharged by the kidneys, its proper emunctories.[1] And unless we suppose extensive renal disease and destruction of tissue or serious obstruction to the excretion of urine, it is not possible that undue accumulation of this substance in the blood should take place. Authors tell us that it is to be considered as undoubtedly excrementitious (Golding Bird, Thudichum); therefore the blood must be depurated from it as it is formed and thrown in upon the circulation, or doubtless the phenomena of systemic disturbance, such as would arise from contaminated blood, would occur. And with this view, we should expect to observe somewhat analogous morbid phenomena to those produced by uræmic poisoning—bearing in mind the close relation to urea which is held by creatine, as has already been mentioned, on the authority of Dr. Thudichum.[2] This supposition, which naturally occurred to us in view of the *excrementitious* nature of the substance in question, seems to find confirmation in the following remarks of the last-named eminent observer. "In disease, the quantity of creatine, together with that of creatinine, might serve to indicate the intensity of any spasmodic or convulsive action. The question as to its quantity in tetanic and epileptic disease is one of high interest. Cases of paralysis agitans, in which the spasmodic action ceases with sleep, may perhaps afford good opportunities for demonstrating the influence of rest and motion; though the different nutrition in the muscle may, perhaps, vary the chemical changes in some degree. These suggestions for future researches must not be taken for theories or suppositions." (*Op. cit.*) There are almost no *data*, so far as we are aware, which could enable us to set forth, with any precision, the effects of an undue accumulation of either creatine or creatinine, considered as urinary elements, in the blood. As the author last quoted intimates, "future researches" can alone enable observers to furnish satisfactory details; and although he is careful to repudiate the idea of issuing theories or suppositions, there seems no great presumption in hazarding the latter, as we have done in a former paragraph; especially in view of a dearth of facts which precludes our offering much upon the subject.

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[1] "Creatine is present in the blood, by which it makes its way to the kidneys. It occurs in the urine as a regular ingredient, though present in small quantities only. It is partly transformed into creatinine, most probably somewhere between the muscle and the urinary residue out of which the zinc salt crystallizes. For in the muscle, creatine has by far the preponderance over creatinine; in the urine, creatinine over creatine. Creatine is, therefore, truly excrementitious; its relation to urea proves this beyond doubt. Its exclusive occurrence in the muscles shows the seat of its formation; it is, with other matters, a product of the chemical changes in the muscles." (Thudichum, *op. cit.*, p. 120.)

[2] In a uræmic case, Hoppe extracted five times the normal amount of creatine from the muscles of the patient. (Braun, *op. cit.*, p. 99.)

Dr. Golding Bird (*Urinary Deposits*, 1857) has some interesting remarks in reference to the modes of excretion of creatine and creatinine, and also in regard to their relation to urea. "Although we have seen that creatine and creatinine are both found in the urine, we must not conclude that they are entirely excreted in this manner. It is very probable that a considerable proportion of creatine is resolved into uric acid or urea before its final elimination. We have already seen the chemical relation of creatine to uric acid, and to urea; its metamorphosis into the latter body, and into the peculiar substance sarcosin (which requires only the addition of the constituents of water to represent the elements of lactate of ammonia) is so readily effected, that a similar change occurring in the body is rendered very probable." (p. 109, English edition.) We may thus observe that it is very possible for a large amount of creatine and creatinine to be thrown out of the system in other ways than by the kidneys—a fortunate circumstance in renal disease, both when these and other urinary elements are concerned.

It is evident, however, that one practical deduction may be drawn from the fact that these substances are the result of muscular waste, viz., that if there is an excessive amount of them observed in the urine for a long time, this waste will also become extreme—consequently, rest and the appropriate treatment for preventing debilitating action should be observed.[1]

Creatinine.—This "substance is found in the muscles of the vertebrate animals, and in the urine of man in larger quantities than in the muscles. It is the product of the natural or artificial decomposition of creatine * * *." (Thudichum.) Its component elements are carbon, hydrogen, nitrogen, and oxygen.

We have nothing further to present relatively to creatinine than what has already been incorporated under the head of creatine.

HIPPURIC ACID.—(Symbol: $\overline{\mathrm{H}}$. Formula: $C_{18}H_8NO_5+HO$.)[2]

Liebig has announced this acid to be a constant ingredient of human urine; a statement which, according to Thudichum, has lately been negatived by Duchek. It is stated that its existence was demonstrated in the urine of young infants by Scheele, Fourcroy, and Reynard. Benzoic acid, when ingested, becomes hippuric acid in the body. (Ure, *Med.-Chir. Transact.*, vol. xxiv.; and Keller, *Ann. d. Chem. und Pharm.*, xliii. p. 198; Thudichum, *op. cit.*)

The *pathology* of hippuric acid is fully as undetermined as that of the two substances we have last considered. Its occurrence in the system in excess has generally been attributed and easily referable, to peculiarities in the diet. According to Dr. Golding Bird and some others, it seems to be found especially in those who live exclusively upon vegetables, milk, and certain kinds of fruit, and to be most constantly observed in persons of

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[1] See, among other references on this point, Dr. Hassall's work on "The Urine in Health and Disease."

[2] Or, $C_{18}H_9NO_6$.—*Thudichum.*

Chemical Composition of Hippuric Acid.

Carbon	60.335
Hydrogen	4.469
Nitrogen	7.821
Oxygen	22.347
Water	5.028
	100.000

Thudichum.

indolent habits. This is esteemed the reason why it is detected in stall-fed cattle, or in well-fed stallions, and not noticed, but replaced by benzoic acid, in cattle that are worked or driven. (*Thudichum et al.*) Dr. Bird ascribes its presence in the urine of nursing infants—a fact already referred to—to their "mal-assimilating the large quantity of carbon contained in the food." This author, moreover, does not consider that it interferes with the production of uric acid; but he observes that in hippuric urine there is generally a deficiency of urea. Reference is also made by him to very interesting cases by Bouchardat, Garrod, and Pettenkofer. In Bouchardat's case, the acid was observed to coexist with albumen in the urine,[1] and an absence of uric acid. The patient had lived for nine years on a milk diet, was fifty-three years old when the case was noted, had resided in the country, had good general health, was in easy circumstances, was the mother of one child, and had ceased to menstruate at the age of forty-five. Gastric and hepatic difficulties of an obscure nature led to her adoption of the milk-diet, and her health was restored. She then partook of a more mixed diet, eating some meat and vegetables; after a time she again became ill, and the chief symptoms were lassitude, dryness of the skin (perspiration having previously been profuse); vague pains in the hepatic region; jaundiced hue; the feces were black; the mouth dry, with a bad taste; there were headache and tinnitus aurium; imperfect vision; palpitation of the heart; excited pulse; anæmic murmur in the carotids; some œdema of the lower limbs; dyspnœa. The chief phenomena, however, were excessive thirst and increase in the quantity of the urine. She often drank from six to ten pints of water in a day. The patient died exhausted.

Dr. Garrod's case was observed in the person of a young man, twenty-three years of age. The first signs of constitutional disturbance were "general malaise," with an excretion of an excess of urea from the kidneys, accompanied by a deposit of the ammoniaco-magnesian phosphate. Atonic dyspepsia, with lumbar pain, succeeded. At this time, hippuric acid, in "long crystals," was detected, and these were slowly incrusted with uric acid. This lasted for several days, and a pint of urine yielded about 40 grains of hippuric acid. Uric acid and urea were observed in normal proportions. The hippuric acid soon decreased, and the urine finally became normal. "No information as to the source of the hippuric acid could be obtained from the history of the patient. He had lived on a mixed diet, and never used any excess of vegetable food, nor had he ever taken any benzoic acid." (*Op. cit.*, p. 211.)

The case reported by Dr. Pettenkofer is regarded by Dr. Bird as perhaps the most interesting of the three. The patient was a girl thirteen years old, affected with chorea, and long subject to it, under the care of Dr. De Marcus, of the Julius Hospital, Wurzburg. There had also been "anomalous hysteric symptoms." She had for a long time lived on apples, bread, and water, refusing any other food. The urine was yellow, limpid, and faintly acid when first excreted; it soon became alkaline, and deposited crystals of the triple phosphate of magnesia. Adding hydrochloric acid to it, after moderate concentration there was "a copious formation of crystals of hippuric acid. The addition of nitric acid, by its oxidizing influence, caused the deposit of hippuric to be replaced by one of benzoic acid. In 1000 parts of urine there were—of

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[1] Dr. Prout remarks that both xanthic oxide and hippuric acid "are undoubtedly of albuminous origin." (*Op. cit.*, p. 238.)

"Water	959.332
Solids	40.668
	1000.
Solids soluble in alcohol	18.451
" insoluble in alcohol	9.417
Anhydrous hippuric acid	12.800
	40.668

Fixed salts, containing much carbonate of soda, 19,599.

"The characters of the urine in this case approached those of an herbivorous animal, in the presence of hippuric acid and of carbonate of soda in the ash, as well as in the absence of uric acid.

"The hippuric acid disappeared, and the urine assumed its normal proportions on inducing the girl to return to a mixed diet." (*Op. cit.*, pp. 211, 212.)

We have given the substance of these cases, because they seem to bear so directly upon the portion of our subject now under examination. If, as may reasonably be inferred, the morbid phenomena, both the early and the later, may be ascribed to that state of the system which at last declared itself by the discovery of an excess of hippuric acid in the urine, we may logically argue that this was the morbific agent; and that the surcharging of the blood with it, and the contamination of the various organs by this vitiated current, is the most plausible explanation. At all events, there seems to have been a direct connection between the morbid condition and the excess of the acid in the system. Dr. Bird and others, as has been mentioned, ascribe its presence in the urine in great excess, to the use of a not sufficiently nitrogenized diet, or to mal-assimilation of the carbon of the food. It has been presumed possible that, through the kidneys, hippuric acid *vicariously* depurates the liver from any excess of carbon. (Bird.) Supposing this to be true, and renal disease to supervene under these circumstances, the most disastrous results would seem to be unavoidable.

There is no symptom or set of symptoms, so far as we are aware, which would indubitably indicate an excess of hippuric acid in the blood; and the manifestations which we have enumerated, occurring as directly antecedent phenomena to the detection of such an excess, and seemingly dependent upon it, are only to be taken as *probably* the explanation thereof. It is, at least, reasonable to conclude, as we previously remarked, that when the acid appears, more or less suddenly, in excess in the urine, it *has been* equally so in the blood, and for a longer or shorter time—the period, possibly, being indicated more or less distinctly by certain morbid signs. Dr. Golding Bird closes his remarks upon the Pathology of Hippuric Acid in the following terms: "My own experience in these cases has been too limited to justify my offering any opinion on the pathological complications attending them. From what little I have observed, I feel inclined to believe that when an excess of hippuric acid exists, it may always be regarded as traceable to, or pathognomonic of, the deficient function of the liver, lungs, or skin, the great emunctories of carbon; or to the use of food deficient in nitrogen. It hence follows, that our treatment will consist in appealing to the function at fault, and carefully regulating the diet.

"I would suggest the propriety of seeking for the presence of hippuric acid in the urine, where it is copious, of low specific gravity, but slightly acid or neutral, and occurring in persons who have a dry and inactive state of surface, with anæmia. In many pseudo-chlorotic cases in both sexes, I am inclined to believe an abnormal proportion of this acid will often be met with." (*Op. cit.*, p. 213.)

Dr. Thudichum refers to the discovery, by Lehmann, of hippuric acid in diabetic urine, whenever he had sought for it; and also in the acid urine of fever-patients, "of which it is said to cause, in part at least, the acid reaction." Hünefeld and Duchek confirmed the experiments of Lehmann. Schlossberger found hippuric acid in the scales of ichthyosis. Whether this was only an isolated instance, "or whether it is of frequent or constant occurrence in that disease," is not stated. (*Auct. ante cit.*)

Many observations are needed before we can attain to any more precise knowledge of the pathology of hippuric acid. The subject is yet in that undeveloped state which induced Dr. Thudichum to conclude his chapter upon it in these words: "The reader will think this a very unsatisfactory chapter, and so indeed it is. We want observations, for which there is a large field open. But undoubtedly some technical difficulties will have to be overcome first, before the analysis of hippuric acid can be made with sufficient accuracy." (*Op. cit.*, p. 152.) This author has recently investigated the subject in its chemical, physiological, and pathological relations; and if he finds the stores of information in regard to it so meagre, and if Dr. Prout was obliged to confess that he was not aware that hippuric acid, either in excess or in deficiency, is characteristic of any peculiar disease (*op. cit.*, p. 239), we surely need not shrink from avowing the poverty of our own knowledge in the matter.

CHLORINE: CHLORIDE OF SODIUM.[1]

Were we to follow Dr. Golding Bird's estimate of the "essential" elements of the urinary secretion, we might now pause in our examination of the list of ingredients which we at first enumerated as entering into its composition. Dr. Bird, after mentioning what he terms the "Organic Products," viz., urea, uric acid, creatine, creatinine, colouring and odorous principles, together with hippuric acid and lactic acid, which latter he also styles "accidental constituents," says that this "class of ingredients can alone be considered as really essential to the urine, and characteristic of it as a secretion, the kidneys being the only organs which normally eliminate these elements from the blood." The *saline* ingredients, as he remarks, "are met with in most secretions of the body, with the exception of the sulphates, which are rarely found except in the urine." The "ingredients derived from the urinary passages" (Dr. Bird's *Third Class*) are found "in all fluids passing over mucous surfaces, the phosphate of lime being derived from the mucus, of which it is a constituent."

Since, however, there are many interesting and important points connected with the consideration of the remaining constituents of the urine as given by Dr. Thudichum, whose table we have adopted in preparing this essay, we will bring them separately under consideration according to our original plan. What we have to present, however, will naturally be more

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[1] Chemical Composition of Chloride of Sodium:—

$$\textit{Formula}: \text{NaCl.} \left\} \begin{array}{l} \text{Sodium} \;.\;.\;.\; 23.3 \\ \text{Chlorine} \;.\;.\; 35.5 \end{array} \right\} 58.8 = 1 \text{ equiv. chloride of sodium.}$$

general, since we have no affections to consider in this relation, which like gout and rheumatism seem to depend so entirely upon some morbific matter retained in the blood. That an excess or diminution of the chlorides and of other matters in the system, has a greater or less bearing and significance in certain diseases, seems to be proved in many instances, and in others rendered extremely probable. It will be our object in the remainder of this essay to illustrate these positions so far as we may be able; bearing in mind that our main purpose is to indicate the results determined by the undue presence of these elementary substances in the circulation.

With regard to the mere presence of *chloride of sodium*—which substance we shall make the foundation of our remarks—in the blood, it is well known that there is always a greater or less amount taken into the system with the food. There is, indeed, a strong natural appetite for salt, both in men and animals; which, however, varies remarkably in different individuals. From the fact of the almost universal desire for it which exists, we cannot suppose that it is, *per se*, ever noxious, unless it be ingested in enormous and unnatural quantities; or unless, through other influences, the proper balance of its proportions in the blood be permanently or for a long time disturbed.

The valuable experiments of Barral,[1] Regnault, and Reiset, alluded to by Dr. Bird, Dr. Thudichum, and others, led to the conclusion that the elimination of the nitrogenized elements of the urine was facilitated by the action of the chloride of sodium. Dr. Thudichum thinks that if equally careful experiments were again conducted "by the more accurate methods" now at our command, we should acquire very important information in respect to the "causes and influences" which determine and modify the amount of chlorine thrown off by the kidneys; and this especially if the feces and other *excreta* were taken into the calculation. Barral ascertained by his experiments, both the whole quantity of chlorine taken with the food, and also that of chlorine and urea excreted. The action of chloride of sodium is certainly salutary also in another way; and which is particularly pointed out by Dr. Thudichum, viz., by its causing thirst, and consequently inducing the ingestion of an increased quantity of water, the diuretic influence of which, by producing a more copious urinary flow, "carries away not only the salt, but also organic ingredients in solution." (*Op. cit.*, p. 165.)

The Relation of Chlorine to Pneumonia and other Acute Diseases.—The very striking fact of the rapid diminution, and occasional temporary disappearance of the *chlorides* in the urine of pneumonic patients—first pointed out by Simon and Redtenbacher, and subsequently sedulously tested by several observers, amongst whom Dr. J. H. Bennett may be named as having supplied us with a large amount of clinical observation—naturally arrested the attention of pathological chemists and medical practitioners. It was at first supposed that the above-mentioned diminution was distinctive of the pneumonic inflammation; but subsequent researches seem to preclude this idea. Dr. Thudichum has lately announced the following proposition relative to this point: "The result of many observations of Vogel and others, last, of myself, then, is that *in all acute febrile diseases the amount of chlorine discharged in the urine sinks rapidly to a minimum, say one hundredth part of the quantity normal to the in-*

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[1] Barral, S. A., "*Statique chimique des Animaux, appliquée specialement à la question du sel,*" Paris, 1850. (Thudichum.)

dividual, until at last, in certain cases, it disappears entirely for a short time. When the diseased action is abating, the amount of the chlorides rises during convalescence, sometimes above the normal average." (*Op. cit.*, pp. 165–6.)

While, therefore, this diminution in and temporary disappearance of the chlorine is not found to be solely characteristic of pneumonia, the cases of that disease in which it has been observed afford very striking illustrations of the fact. For detailed accounts of these, the recent work of Dr. Bennett, already referred to, may be consulted with great advantage. Dr. Beale, of London, has also given us much reliable information upon this important topic. (See *Medico-Chirurgical Transactions*, vol. xxxv.) The rule in pneumonia seems to be that the diminution of the chlorides indicates the progressive stage of the disease; at its height, the chlorides may wholly disappear; their reappearance is a sign of improvement, with cessation of the inflammatory action, and occurrence of the *crepitus redux.* Dr. Bennett thinks it established that, although absence of the chlorides may be found to exist in some other diseases, and may thus lessen the value of the sign in pneumonia, it yet leaves it unaffected in importance, "as pointing out the onward progress of that disease." (*Op. cit.*, p. 640.) The appearance of the chloride of sodium—thus excluded from the urine of pneumonic patients—in the *sputa*, and its desertion of the sputa when it again becomes manifest in the urine, is another remarkable fact connected with these observations. Experiments conducted by Mr. Seymour, Clinical Clerk, upon more than sixty pneumonic patients in Dr. Bennett's wards, established the fact that the chlorides were absent in all but one; and that was a case of phthisis, with *intercurrent* pneumonia.

The question to which we now recur, is virtually that at the foundation of our present researches, viz., *does any morbid action result from the retention of the chlorides in the blood?* Irrespective of what we have already said of the avidity with which the chloride of sodium is sought by man and animals, and its innocent nature unless inordinately ingested—when, indeed, it would in all probability be either vomited or discharged from the bowels—we learn from chemical and medical authority that the blood always retains a portion of the chlorides. The fact of the chlorides being found in large quantity in pneumonic sputa, is explained on this ground by Dr. Thudichum, viz., that sputa being, in part at least, "extravasations and exudations from the blood," the chlorides would naturally appear in a substance partly composed of exuded and "stagnant" blood. It does not seem, then, from all that we can discover is as yet known, and considered as material from which to draw conclusions, that pneumonia, or the other diseases in which the absence of the chlorides from the urine is remarked as a feature, can be distinctly ascribed to that fact as a prime cause. Were this to be predicated of any one affection, however, it would certainly be of pneumonia. An extensive field is open for important and interesting observations in the direction of the present inquiry; but should it be hereafter ascertained that the amounts of chlorine absent from the urine, and therefore presumed to be circulating in the blood, are to be considered as more or less poisonous, either by their quantity or quality, we still must remember, in estimating such an action, that there are other channels of excretion open, by which a portion of the chlorine is excreted. The constant occurrence of diminution or abolition of the chlorides in pneumonia, is a curious and important fact; but, as yet, not sufficiently illustrated by observations and study, to take the place of an etiological element of disease. Dr. Thudichum states, in respect to the questions under consideration, "the absence of the chlorides in the urine does not necessarily involve the absence of chlorine from exudations. For the latter are products of diseased action derived directly from stagnant blood, and certainly not subject to the specific laws of secretion. The presence of chlorine in sputa, therefore, at a time when it is absent from the urine, is not sufficient proof of a determination of the chloride towards the inflamed lung; a proposition which, moreover, loses all probability from the partial or total disappearance from the urine of the chloride in all acute diseases." (*Op. cit.*, p. 166.) He then enumerates bronchitis, typhus, acute rheumatism, pyæmia, and pleuritis, as examples of this fact; and also refers to the influence exerted in the system by varying quantities of chlorine introduced into it with the food, ascribing no inconsiderable amount of this effect to the sort of diet used by the patient when the quantity of chlorine in "pathological urine" is to be estimated. In most acute diseases, it is known that patients take but little food—often none—and that the articles they eat are often unsalted. Another fact of consequence, which is insisted on by Dr. Thudichum, is, "that urine containing no appreciable trace of chlorine is secreted from blood containing a certain amount of it; from which it follows that the composition of the blood is such as not to allow any further removal of chlorine, or that the kidneys have lost their secretory activity as regards chlorine, as well as (which has been seen to be the case) with reference to water." (p. 167.)

As has been shown to be the fact with regard to pneumonia, so it may, in the opinion of the latter writer and others (and it is no less deducible analogically), be considered available to esteem the amount of chlorine in the urine, a gauge of the amount of morbid action going on in the system in certain other affections. That is, an estimate, more or less accurate, may be made as to the *severity* and *activity* of the disease. The minimum of chlorine in the urine, in making such estimates, Dr. Thudichum places at 0.5 gramme; and after that, in the intensity of the disorder it may, as we have seen, be altogether wanting. "This may be the combined effect of an entire loss of appetite, copious serous diarrhœa, or other serous exudations; of secretions, such as perspirations; and of the want of secreting power of the kidneys. A rise in the amount of chlorine, on the other hand, indicates a steady abatement of the acuteness of the disease, and is a good measure of the returning appetite and improved digestive powers of the patient."

We referred, previously, to the experiments of Barral and others, which seemed to show increased activity of nitrogenous elimination through the agency of chloride of sodium. Dr. Golding Bird remarks, in this connection, that it would seem that this chloride, "besides furnishing hydrochloric acid to the stomach, and soda to the bile, also exerts an important physiological influence in aiding the metamorphosis of tissue, and consequent depuration of the blood." (*Op. cit.*, p. 127.) If we accept this as true, we not only need not ascribe any morbid effects to the retention of chlorine —or of chloride of sodium—in the blood, but rather deem its presence desirable and salutary—at all events, in the vast majority of cases.

Certain of Hegar's conclusions, which were arrived at under the superintendence of Liebig and Vogel (G. Bird), are interesting in this connection. We select a few, in illustration :—

"The amount [of chlorine in the urine] varied in different individuals, depending partly on the food, and partly on habit of life and constitution."

"It was increased by exercise and copious draughts of water, which appeared to act by washing it out of the system, as the augmentation was only temporary." "Indisposition diminished the quantity." "In health, though no chlorides were taken with the food, they were always found, and must therefore have been obtained from the blood or tissues." "When a larger quantity was taken than usual, the whole did not escape from the system by the kidneys, nor even the bowels."

The latter two facts would seem to go far to prove the innocuousness of even considerable amounts of chlorine in the blood. Dr. Day (*Contributions to Urology*) is quoted by Dr. Bird as testifying to the fact to which we have previously called attention; that the chlorides are diminished in all cases of disease accompanied by copious exudation from the blood.

We notice that Dr. Bird asserts, as from Dr. Beale, that the nature of the diet necessarily adopted in pneumonia and other acute diseases, seems insufficient to explain the absence of the chlorides from the urine. Doubtless this default of ingestion of chlorine will not fully meet the requirements of the case in the way of explanation, but it seems only reasonable to allow it no inconsiderable weight. The following are Dr. Beale's very important propositions:—

"1. That chloride of sodium is totally absent from the urine of pneumonic patients at the period of complete hepatization of the lung.

"2. The chloride reappears after the resolution of the inflammation.

"3. The chloride exists in the blood in the largest quantity, when most abundant in the urine, and *vice versâ*. [We may here, again, find reason for inferring the harmlessness of even large quantities of chloride of sodium in the blood; for when it is considered that under these circumstances, *were it easily, or at all, a cause of disease*, the conditions for the development of morbid action abundantly exist, we certainly have sufficient ground for the above opinion.]

"4. The chloride exists in very large quantity in the sputa of pneumonic patients.

"5. There is reason to believe that in pneumonia the chloride is determined towards the inflamed lung, and is re-absorbed and removed on the resolution of the inflammation."

The validity of this latter proposition, as we have previously stated, is denied by Dr. Thudichum; and if it is meant thereby, as it would seem to imply, that the chloride of sodium is the morbific material, we cannot see any sufficient reason to suppose such a relation of cause and effect as by any means certain. That there is a degree of plausibility about it, we confess; but not, at present, any satisfactory proof.

In chronic diseases, the amount of chlorine excreted is usually diminished. This would tend to ratify the supposition that failure of the appetite, and the consequent less ingestion of food, explain the decrease in the chlorine introduced into the system; and the fact consorts, also, with the enfeebled nutrition. Lecanu found the quantity of chloride of sodium very small in the urine of women and old men (*Simon's Chemistry*, vol. ii. p. 167. Sydenham Society's edition.) Observers point out *diabetes insipidus* as an exception to this rule; the chlorine discharged being in excess. So, in dropsy, Vogel found the chlorine increased under artificial diuresis. Chlorine here becomes a gauge of the powers of digestion. It may be inferred that digestion is in good order, when from six to ten grammes are excreted in twenty-four hours; any quantity below five grammes, for the same period, declares an impaired nutrition, unless the diminution can justly be ascribed to a diet very deficient in chlorine, or entirely without any. So those discharges which diminish the amount of chlorine contained in the blood, "as serous diarrhœa, exudations and perspirations," should be taken into account in making an estimate of the morbid action. When the amount of chlorine is very largely increased, and there has been no corresponding plentiful supply by ingestion, *diabetes insipidus* may be inferred. "In dropsical and hydræmic conditions, an increase of the amount of chlorine is a favourable symptom." (Vogel, by Thudichum, *op. cit.*, p. 168.)

If this portion of our subject seems to have been presented in a somewhat negative manner, it is because the information attainable in reference to it is of the same nature. We seem able to say rather wherein the presence of chlorine in the blood—at all events of such amounts as are derivable from diverted excretion thereof by the kidneys—is harmless or even beneficial. Notwithstanding, it must be confessed, that observations and researches upon this point are not available in such quantity as to enable any one, at present, to set forth entirely reliable practical rules and conclusions.

Sulphuric Acid. (Formula: SO_3+HO[1]: Equivalent, 16.0 Sulphur; 24.0 Oxygen=40.0, Sulphuric Acid.)

A variable, and often very considerable amount of sulphuric acid is discharged from the body by the kidneys during each twenty-four hours. When it is considered that sulphur must nearly always exist in the blood, in greater or less amount—being derived from the food—it will be conceded that it is unlikely that any retention of it therein, even after its oxidation, unless it be present in very large and improbable quantities, would be influential in inducing actual disease. We will examine the known relations of sulphuric acid, as contained in the urine, to the system—so far as facts enable us to present anything worthy of credence and likely to prove of service.

Liebig, referring to Wöhler's experiments, ascribes the sulphuric acid generated in the system, to the action of the oxygen of the atmosphere upon the sulphur introduced into the blood through the medium of food—and this is particularly true of the albuminous portion thereof, which, of course, constitutes, as a general thing, a large amount of the whole. This process of oxidation, and consequent manufacture of sulphuric acid in the system, carried on as it is through the medium of the blood itself, seems to confirm our previously announced opinion, that this acid, in itself, is innocuous. If a very large amount were long and habitually retained in the circulation, it will be easy to understand that mischief might ensue. Before examining any possible or probable pathological issues, we will further allude to certain physiological facts connected with the existence of sulphuric acid in the system, and its excretion from it. It should be said, before proceeding further, that the oxidizing process above mentioned accounts for the surplus of sulphuric acid which is eliminated from the body, over and above what is ingested with the food, in the form of sulphates. (Liebig, Simon, Thudichum.) It is therefore evident that a full animal diet will, by introducing more sulphur into the blood, increase the amount of sulphuric acid in the urine—and that, under the same conditions, more must, for a time at least, be contained in the blood. The experiments of Lehmann on himself show conclusively the effect of different sorts of diet in increasing or diminishing the quantity of sulphuric acid passed in the urine. Thus, while on a "mixed" diet, 7.026 grammes of the acid were collected during twenty-four hours; when animal food was exclusively used, the quantity rose to 10.399 grammes in the same time; when living on vegetables exclusively, only 5.846 grammes were obtainable in the course of one day. Dr. Thudichum, commenting upon these quantities, pronounces them very high, and is inclined to attribute this to Lehmann's appetite. He was, it is true, in fine health and of robust constitution, and therefore some allowance is to be made; but, as Dr. Thudichum also implies, the intrinsic value of the experiments is unaltered by the mere amounts. The *ratio* of formation of the acid, under the differing influences, is the essential point. Certain very conclusive experiments by Vogel, Clare, and others upon this subject, are given in some detail in the work of Dr. Thudichum. The results are the same in character as those obtained by Lehmann.

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[1] "Being the hydrate of sulphuric acid." (Thudichum, *op. cit.*)

There exists, as yet, no test or other means of revelation, so far as we are aware, which can inform us what amount of sulphuric acid may be required by the system in its different states. We know the beneficial effects derived from its medicinal use as a tonic, refrigerant and astringent; and thus it would appear that in certain states of the constitution it is especially suitable—we may, indeed, say indicated. Whether a certain amount of the sulphates must enter into the circulation in order to perfect secretion, "or whether sulphates may be retained and accumulated in the economy," is, at present, unknown. Dr. Thudichum, while stating this fact, mentions that neither rest, nor activity, nor the ingestion of large quantities of water, seemed materially to affect the amounts of sulphuric acid in the urine, in certain of the experiments of Clare and Gruner. Vogel, however, he states, believed "it probable that such influences exist, that the secretory activity for sulphuric acid is dependent upon certain individual and cosmic influences" (*op. cit.*, p. 175); and this is rendered nearly certain by the fact of the difference in the rapidity of oxidation of the introduced sulphur observed in various persons. A very significant opinion of Vogel, quoted by Dr. Thudichum, is of importance as affording a valuable suggestion closely connected with our present inquiries, and in respect to which we need more extended observation. It will be seen, as we just remarked, that the suggestion bears directly upon the point which now engages our attention; and all inquiries of this nature must tend greatly to advance our knowledge of any diseased conditions (and of the remedial measures suited to them) which may reasonably be supposed to depend, even remotely, upon an undue accumulation of the products we are considering, in the blood. The statement to which we have reference is as follows:—

> "Vogel, also, from observation, is of opinion that the prolonged use of sulphates in digestive doses is decidedly weakening, and believes it probable that this depressing action may be due to an accumulation of the salts in the system. When to this it is added that sulphate of soda in larger doses is an emetic, and sulphate of potash a poison, the question as to the influence of sulphuric acid and sulphates in the urine becomes one of sufficient importance to fix the attention of future inquirers." (*Loc. cit.*, p. 176.)

From the same sources of authority we learn that the amount of sulphuric acid in the urine is diminished in febrile diseases. This, as is plausibly suggested, may, in great measure, be ascribable to the nature of the food taken, viz., mainly vegetable—less sulphur being thus supplied to the blood; and it must also be remembered that the *quantity* of food is very greatly diminished under such disordered conditions.

Dr. H. Bence Jones (*Medico-Chirurgical Transactions*, vol. xxxiv.) found the amount of the sulphates increased in *chorea*, and in aggravated cases of *delirium tremens;* and he likewise notes a similar augmentation, both of the sulphates and phosphates, in cerebral inflammation. He ascribes this occurrence to the rapid disintegration of muscular tissue in the former affections, and to excessive and rapid oxidation of the cerebral substance in the latter.

Vogel found, in three pneumonic patients, the amount of sulphuric acid discharged, exceptionally, "above the normal average." In chronic diseases, while the quantity was variable, it was generally below the standard amount. It was not increased under a diuretic action which largely augmented the discharge of the chlorides, as in cases of dropsy. The ingestion of sulphuric acid and sulphates by patients labouring under chronic disease, alone produced any increase in the amount excreted; and a hearty meal of animal food had the same effect in patients suffering from diabetes.

While we are obliged to speak doubtfully as to any abnormal effects ascribable to the action of various amounts of sulphuric acid retained in the circulation, we can say—as we have already once stated—that such effects, from any increased amount likely to be thrown into the blood by failure of the renal excretory function devoted to separating this acid, are not such as to be defined, with our present knowledge; nor can we believe any very serious results likely to follow under such circumstances. If *all* the urinary elements were retained, or only such as greatly predominate—and which we have previously considered—then the other accidents, already detailed, would very surely mask any minor morbid action; and if either urea or uric acid predominated, we should have their peculiar concomitant or resulting phenomena, to the exclusion of any weaker manifestations. While, therefore, nothing positive can be charged to the presence of sulphuric acid in excess (more or less) in the system, we are fortunate in having suggestions from reliable sources, and accurate chemical observations from many competent hands. And all will join Dr. Thudichum in estimating very highly the determination of the quantity of this acid in the urine as being a sort of index of "the amount of disintegration of albuminous matters in the system, in cases where the ingestion of sulphur in any form or combination is very low or altogether suspended." He goes on, also, to remark that possibly a degree of correspondence of the acid with urea, in amount, might be found to exist, "supposing their inclination to pass the kidneys to be equally great. But upon this point there are yet doubts." (p. 177.) If both sulphuric acid and urea be largely excreted, we are to infer that very free oxidation is going on in the system, and is due to the ingestion of animal food in abundance. The opposite condition with respect to sulphuric acid, would go to show a diminution in, or entire deprivation of animal and vegetable food. These states may be either constant or accidental. (Thudichum.) We have already hinted that a sudden, temporary increase in the amount of sulphuric acid excreted, would seem to indicate a reception of sulphur, in some of its forms, into the system, and that too in large quantity.

Dr. Thudichum thinks that new analyses of the blood will have to be made, and without incinerating it. This, he states, "destroys the relative proportions of acids and bases in the salts of the alkalies." We may thus hope not only for more accurate chemical information upon these points, but also that new and more abundant pathological inferences will be drawn from such researches. The fact that the production of sulphuric acid is proved, to all appearance, to be restricted to the blood, and that it is formed through the agency of the oxygen of the air, by means of the respiratory function, is highly important in relation to the present portion of our subject. Its being formed, in great measure, in the blood, is favourable to the idea we have before mentioned, viz., that the vital fluid will be more likely to tolerate its presence, even in large quantities. If this opinion should be deemed merely speculative, we can only say that most of the information now existing upon the subject is of the same nature.

Another interesting question, founded upon the seeming fact that the sulphuric acid is in great part formed in the blood, from the aliments—and also referring to the remark by Liebig, "that the acid nature of the urine of carnivorous animals, as well as that of men, depends upon the nature of the bases partaken of in the aliments, and upon the particular form of their combination"[1]—is, how far the office of the kidneys is to finish the "final oxidation, or that stage of disintegration of albuminous matter in which sulphur, in the form of sulphuric acid, leaves the organic combination, joins a base, and appears in the urine." (Thudichum, *op. cit.*, p. 178.) These, and other chemico-pathological inquiries, as has already been intimated, must be left to future investigators to determine. So far as our present means afford us any ground for the pathological inferences connected with this portion of our subject, we are compelled—after having presented what, for the greater part, is as yet conjectural and undetermined, although seemingly interspersed with the elements of truth, and certainly accompanied by many precise chemical facts—to rest the matter here.

PHOSPHORIC ACID.—(Formula: PO_5+3HO.)[2]

This acid is the next regular constituent of the urine which we are to consider, pathologically. Previous to entering into any particulars, it may be said that its position in relation to pathological states of the system, generally, very closely resembles that of sulphuric acid. We shall therefore treat of it in much the same manner as was adopted in examining the latter substance.

Phosphorus enters the system constantly, and often in very considerable quantities. It is taken with the food, and it has also been long medicinally ordered. Within a short time, indeed, the *phosphates* and *phosphites* of lime and soda have been prescribed with variable results, as *nervines*, and also as being suited to combat the ravages of tuberculous disease of the lungs. In certain cases, we may add, they are reported to have been of service; and we can recall cases of general prostration, and of what has been sometimes termed "nervous debility," in which we have used them with apparently marked benefit. To Dr. Churchill, now of Paris, belongs,

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[1] Liebig, quoted in Simon's Chemistry, vol. ii. p. 153. (Lancet, 1844.)

[2] "The common or tribasic phosphoric acid."

Chemical Composition of Phosphoric Acid.

1 equivalent phosphorus	P=31.436
8 equivalents oxygen	=64.000
3 equivalents hydrogen	= 3.000
1 equivalent of phosphoric acid	=98.436

"The theory which assumes P to be a double atom, and the single atomic weight=15.718, uses P_2 as the symbol for the above equivalent of phosphorus. This is an explanation to the reader, should he find himself embarrassed by the formulæ of different authors."—*Thudichum.*

we believe, the credit of suggesting their persevering employment in threatened, or actually existing, pulmonary consumption. The success attained, although flattering in many instances—as we learned, personally, not long since, in the French capital—has not, by any means, justified the expectations at first excited.

This seeming digression from the immediate course of our subject, is not, after all, an element actually foreign to its consideration; for we may thus at least be led to examine what cases will be likely to derive benefit from the ingestion of phosphorus into the system.

The amount of phosphoric acid present, normally, in the urine, is considerably less, according to Becquerel and Rodier, Golding Bird, Johnson, Prout and others, than that of sulphuric acid; and it is found in combination with lime, ammonia, soda, or magnesia. Dr. Thudichum, we notice, in his estimate in the table from which we have taken our list of urinary constituents, has made the amount greater. In the system generally, the quantities existing at different times, will vary from nearly the same causes as have been assigned for the changes in the quantity of sulphuric acid; viz., the nature and amount of the food taken, and the ingestion or otherwise, of phosphorus in a medicinal form. The same difference in rapidity of excretion of phosphoric acid, is observed in different persons, as is true with regard to sulphuric acid. And in respect to the activity and amount of excretion, the same variations are to be remarked as have been recorded for chlorine and sulphuric acid. Therefore, renal disease must be considered an important *pathological* influence in respect to the amounts excreted, as personal peculiarities and fortuitous circumstances as to diet, &c., are observed to be, *physiologically*. We learn from Vogel, that copious draughts of water will increase the amount of phosphoric acid excreted by the kidneys—a fact similar to what has been mentioned in respect to the chlorides. As Dr. Thudichum remarks, in commenting upon this point, and as we have previously intimated, "the organism may at one time contain an excess of phosphoric acid, at other times the acid may be deficient." "It will, however," he adds, "be difficult fully to establish these points, until the normal amount of phosphoric acid contained in all parts of the body, and its changes and variations, within the range of perfect health, be known. And then the examinations will have to comprise a complete analysis of all food, and of all excretions." (*Op. cit.*, p. 188.)

The decrease of phosphoric acid in acute disease, noticed by Vogel, is ascribed partially, as was the fact with regard to sulphuric acid, to the *diminution* and *quality* of the diet ordered or made necessary. When the rations are richer and more liberal, the phosphoric acid increases in quantity; and in convalescence the normal amount is often exceeded, owing to the increased ingestion of food. The decrease of phosphoric acid bears a notable proportion to the *period of time* the illness lasts—even if the attack be violent, and much fever accompany. If short, there is little variation in the amount of acid excreted, and *vice versâ*. Severity and prolongation of the disease, with great diminution of, or total abstinence from food, causes very marked decrease in the quantity of phosphoric acid appearing in the urine. In *chronic diseases*, no rule is observed. Sometimes, and indeed usually, there is great diminution in the amount, and again there may be excess.

Certain statistics supplied by Dr. Thudichum, relatively to the quantities of phosphoric acid excreted in various diseases, and at different stages of each affection, have an important bearing upon the subject. In a table given by him (*op. cit.*, p. 191), the most remarkable points, perhaps, are that the largest amount mentioned ("maximum") as excreted, was in the case of a *female* with diabetes insipidus (7.8 grammes); the next largest, in a *male*, suffering from *hydruria* (5.8 grammes). This seemingly ratifies the remarks and observations previously made, that where the kidneys are most actively employed, the most phosphoric acid is excreted.

If the question be now asked, whether there is any relation between the deficient excretion of the acid in question, and the diseases which have been specified as exhibiting less of the excreted product during their acute course —this implying the retention of a greater or less amount of the substance in the blood—we must admit that no positive proof of this absolute connection as yet exists. In this respect, as in many others pathologically important, the subject is very much in the position of the one last examined. We have already, incidentally, referred to the detection of an increased amount of the phosphates—in connection with the sulphates—in the urine of persons with cerebritis, by Dr. H. Bence Jones. This phenomenon, ascribed by that accomplished observer to rapid oxidation of the cerebral tissues, will, we conclude, hardly justify us in ascribing the inflammatory attack upon the brain, in any degree, to increase and undue retention of the phosphoric acid in the circulation. It does not appear, moreover, that the kidneys were at all disabled; had they been, it is not impossible but more serious mischief might have occurred in such cases—although it is known that a portion of the phosphorus entering the system, goes off by the bowels, as well as from the kidneys.

EARTHY PHOSPHATES.[1]

We have previously mentioned the medicinal use of the phosphates, with the purpose of adding to the nervous force, and in the hope of obviating tuberculous disease. The phosphates of lime and of soda have thus far been prominent in these respects. The latter is physiologically essential

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[1] *Chemical Composition of the Phosphates.*

Ammonio-phosphate of soda $=PO_5+NaO+NH_4O+HO+8HO$.	*of Alkalies.*
Acid " " " $=PO_5+NaO+2HO$.	
Ammonio-phosphate of magnesia $=PO_5+2MgO+NH_4O+12HO$.	*Phosphates of the Alkalies and Earths.*
Phosphate of lime (acid), $=PO_5+2CaO+HO$.	*of the Alkaline Earths.*
Phosphate of magnesia, $=PO_5+2MgO+HO$.	

Thudichum.

Phosphate of soda	$(HO,2NaO,P_2O_5)+24HO$.
Ammonio-phosphate of soda . . .	$(HO,NH_4O,NaO,P_2O_5)+8HO$.
Phosphate of lime	$(HO,2CaO,P_2O_5)$
Ammonio-phosphate of magnesia . .	$(NH_4O,2MgO,P_2O_5)+12HO$.
Neutral phosphate of soda	$(HO,2NaO,P_2O_5)+26HO$.
Acid phosphate of soda	$(12HO,NaO,P_2O_5)+2HO$.)

G. Bird.

Robin and Verdeil have pronounced the two salts, last described, to be normal constituents of the urine.

to the integrity of the blood and body.[1] (Liebig, Thudichum.) The proportion of earthy phosphates discharged daily is found to be very variable in different persons; and, according to the most reliable authorities, no average amount can yet be declared. Lehmann, when living upon a mixed diet, discharged, on the average, 1.09 grammes, daily; when his food was exclusively of an animal nature, the amount became 3.56.[2]

Pathologically, the effect of the presence of an unusual amount of the earthy phosphates in the system, would depend very much upon the integrity of the kidneys. If the latter were disabled, and even if not particularly disorganized—sometimes, even, if nearly healthy—there might be large deposition of these substances in various parts of the urinary passages. The circulation would in this manner be freed from an embarrassing amount of them, but the morbid effects of such an abundant deposit would certainly prove very troublesome. Vesical calculi are rarely *entirely* composed of the phosphates. Such is their friable nature and tendency to a pulverulent condition, that they prefer a nucleus of some sort, around which to accrete, rather than to form pure aggregations of their own substance.

Dr. Thudichum believes that "the originators of the term phosphatic diathesis and phosphuria, and their followers, linked a series of the most varied disorders together under this term, which had nothing in common but one symptom, namely, alkaline urine." (*Op. cit.*, p. 211.) He then proceeds to explain in a very clear manner, the reasons for a greater or less acidity or alkalinity of the urine. And alkalinity may thus be often due to a lack of animal food, by which a suitable amount of acid is usually supplied. Therefore the invalid and the poor man are alike liable to pass very alkaline urine—the dyspeptic from want of appetite, and the pauper from want of means. A vegetable or fruit diet, alone, will make the urine alkaline; and those who cannot digest, or imagine they cannot digest meat, and therefore try a vegetable diet, will almost certainly have alkaline urine. In anæmia, a meat-diet will soon produce an acid urine, with the phosphates, where no acidity existed before.

It would appear, then, so far as conclusions can at present be drawn, that a certain amount of phosphoric acid is not only physiologically necessary (*phosphate of soda*), but that certain states of the system require additional amounts medicinally, or by food. The ammoniacal urine of patients who labour under spinal disease or injury, or who are suffering from other affections giving rise to retention and stagnation of the urine, and its alkaline change, is referable to a local cause; and the mischief which undoubtedly results to the circulation by reason of this state of things, is part and parcel of the causative disease. If inordinate quantities of the phosphates are passed for a long time, we should certainly look for systemic disorder; and doubtless the general health would soon be found to deteriorate. Some *specific* cause might be detected for such failure—unless an unusual quantity of phosphoric acid were being introduced into the system, to account both for the large corresponding excretion, and for unimpaired health—should the latter be observed to exist. But usually, with such a state of things, impaired nervous energy, dyspepsia with irritability, and various functional disturbances, will be present.

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[1] "There is no known salt the chemical characters of which approach more closely to those of the serum of blood than the phosphate of soda; there is none more fitted for the absorption and entire removal from the organism of carbonic acid."—Liebig, Researches on the Chemistry of Food, and the Motion of the Juices in the Animal Body. Dr. Gregory's Translation, American edition, by Prof. E. N. Horsford, 1848.

[2] In connection with the presence of phosphoric acid and of chloride of sodium in the system, the following remarks of Liebig have an interest and importance: "In some pathological conditions there has been observed (Schmidt, *Annalen der Chimie und Pharmacie*, vol. lxi. p. 329), at points where bones and muscles meet, an accumulation of free lactic and phosphoric acid, which has never been perceived at those points in the normal state. The solution and removal of the phosphate of lime, and therefore the disappearance of the bones, is a consequence of this state. It is not improbable that the cause, or one of the causes of this separation of acid from the substance of the muscles is this—that the vessels which contain the fluid of the muscles have undergone a change whereby they lose the property of retaining within them the acid fluid they contain.

"The constant occurrence of chloride of sodium and phosphate of soda in the blood, and that of phosphate of potash and chloride of potassium in the juice of flesh, justify the assumption that both facts are altogether indispensable for the processes carried on in the blood and in the fluid of the muscles." (*Op. sup. cit.*, p. 90.)

The extraordinary case reported by Dr. Golding Bird, of the man who passed very large quantities of the phosphate of lime, without apparent harm to his constitution (excepting that he was always dyspeptic), is believed by Dr. Thudichum to be an instance of imposture. There certainly seems to be some reason for so regarding it. The patient had been under the care "of half the hospital physicians and surgeons in London," during fifty years. It is remarked that very possibly he might wish to be an object of permanent interest to whatever physician attended him, and that he liked hospital quarters. At one time he brought more than an ounce of the above-mentioned salt to Dr. Bird, and which he asserted was passed from himself. His urine was milky, and abundantly deposited the salt, as stated. It is not, however, impossible that he may have been even a longer time collecting the large quantity shown to Dr. Bird, than is suggested by Dr. Thudichum, viz., sixteen days. The man's health was so good that no treatment seemed justifiable, except on account of an apprehension that a vesical calculus might form.[1] Dr. Thudichum does not think Dr. Bird's explanation of the case founded on fact;[2] and he refers to Dr. Prout's remarks upon this point, as follows:—

> "If the reader should not share our doubts, he may adopt the explanation by Dr. G. Bird, for which, however, there is no basis in fact; or he may explain it upon the ground of the following observation recorded by Dr. Prout. (p. 323, note.) This physician examined the body of a gentleman who, during the greater part of his life, had suffered from renal disease, remarkable for being attended by the secretion of large quantities of the earthy phosphates. Both kidneys were not only extensively disorganized, but most of the natural cavities,

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[1] It would therefore seem that his *dyspeptic* symptoms were not very urgent.

[2] The following are Dr. Bird's explanatory remarks: "In cases of this kind it is very possible that the phosphate of lime is secreted from the mucous membrane of the bladder, and not derived from the urine. All mucous secretions contain phosphoric acid, combined with earthy bases; and hence if an excess of the latter is secreted with the vesical mucus, it may be washed away with the urine and form a deposit. This is by no means unfrequent in the irritable bladder, depending on the existence of prostatic diseases, &c.: we have a perfect analogy to this in the calculous concretions found in the ducts of glands furnishing mucous secretions. These are all prone to secrete phosphates in too great an excess to be washed away with the secretion; they are therefore retained and form a calculus. These, from whatever part of the body they are obtained, present nearly the same composition." (*Urinary Deposits.* Dr. Birkett's edition, 1857, p. 306.)

as well as many cysts, were found distended with numerous earthy concretions, of various sizes and composition. The concretions found in those cavities *to which the urine had access*, consisted of the phosphate and carbonate of lime, and more or less of the triple phosphate of ammonia and magnesia, while those cavities or cysts distinct from the renal structure, and to which, therefore, *the urine had no access*, consisted of the calcareous phosphate and carbonate only, without any admixture of the triple phosphate." (*Op. cit.*, p. 213.)

When what is termed the "phosphatic diathesis" exists, or when we find copious phosphatic deposits in the urine, we are to expect in such patients a state of debility, listlessness and exhaustion, mental and physical —a sort of cachexia, with disturbed digestion, and an irritable state of the digestive organs; and also, either some manifest or concealed disorder of the nervous system. To this condition we have already referred. Such symptoms should lead to the adoption of an alterative and tonic treatment, and to such examination of the patient hygienically and constitutionally, as will doubtless soon afford a knowledge of the chief source of difficulty —whether functional or systemic; and if the latter, whether the cerebro-spinal, or renal organs are at fault; or whether the blood itself be surcharged with matters fit only for elimination. Old people often exhibit a train of symptoms indicating troubles referable to what is styled "the phosphatic diathesis." Dr. Bird well describes the state when he writes that there "is irritability with depression, a kind of erethism of the nervous system, if the expression be permitted, like that observed after considerable losses of blood."

It seems peculiarly appropriate to introduce in this place the conclusions of Dr. H. Bence Jones in reference to the pathological bearing of phosphatic salts in the economy—much of what we have previously said seems to find ratification in these opinions, and perhaps we could not better conclude our examination of this department of our subject than by presenting them.

"1. No determination of an excessive secretion of phosphoric acid can be afforded by the deposit of earthy salts, unless the quantity of lime and magnesia in the food be taken into account.

"2. No *real increase* of phosphatic salts occurs in spinal diseases, notwithstanding the existence of deposits.

"3. In fever, and in most acute inflammations, the phosphatic salts are not increased.

"4. In old cases of mania, melancholy, paralysis of the insane, or in chronic cases of disease in which nervous tissues are uninfluenced, no conclusions can be drawn.

"5. In fractures of the skull the phosphatic salts increase only when any inflammatory action occurs in the brain, and in acute phrenitis an excessive increase takes place.

"6. In delirium tremens there is a marked deficiency of phosphates unless they are introduced with the ingesta; an excess is, however, met with in some functional affections of the brain."[1]

In this connection, we cannot but allude to the zealous, and, as it would seem, very sensible, recommendation, by Dr. Bird, of what he appropriately terms "renal depurants." Knowing, as we do, from unmistakable symptoms, that a poisonous substance is traversing the blood, and thus pervading all the bodily tissues, it is our manifest duty to use some such means for stimulating a sluggish, or even a partially diseased kidney, to freer elimination. And there are many substances which may be effectually employed in this manner, and innocuously, or even beneficially to the kidneys themselves. Indeed, when there is even some degree of risk in demanding extra work from those organs, it is better to tax them rather severely, than to allow the accumulation of morbid matters, of any kind, in the blood. "The alkalies, their carbonates, and their salts, with such acids as in the animal economy are capable of being converted into carbonic acid. including the acetates, tartrates, citrates of soda and potass," are properly "renal depurants." (Bird, *Op. cit.*, p. 452.)

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[1] We transcribe these statements as given in Dr. Bird's volume; consulting at the same time Dr. Jones's papers on the Sulphates and Phosphates, contained in the 30th and 34th volumes of the Medico-Chirurgical Society's Transactions.

AMMONIA.—Symbol: NH_3; Equivalent, 17.0.[1]

Ammonia exists in comparatively very small proportions in fresh and healthy urine.[2] Liebig, indeed, doubts whether it can indubitably be pronounced an invariable and constant constituent of normal urine. In these doubts he is joined by Lehmann and Scherer. Dr. Thudichum, who has investigated the subject in his treatise already largely referred to, thinks the researches of Boussingault more satisfactory than those of Bœcker and De Vry; and that they tend to show the presence of this substance in the urine. Neubauer (*Journal für Practische Chemie*, Bd. 64, p. 177, and *Anleitung*, § 56), according to the same writer, has afforded the best proof, thus far, of the presence of certain amounts of ammonia in the urine. His analyses were made by the method of Schlösing. In regard to this process, Dr. Thudichum remarks: "There is only one objection to this method, which I have already advanced; the ammonia is set free by the addition to the urine of milk of lime. Now, if it can be proved that milk of lime, at the ordinary temperature of the air does not within a reasonable limit of time create ammonia from urea and the other organic substances, we are bound to say that an essential progress would be effected by these researches of Neubauer. The subject of ammonia in connection with the animal economy would be of immense importance, if it should be proved beyond the shadow of a doubt, what Dr. Richardson (Astley Cooper, Prize Essay for 1856, On the Cause of the Coagulation of the Blood) has endeavoured to show, namely, that ammonia is a regular constituent of the blood, and the solvent of fibrin in the living body." (pp. 219, 220.)

According to the same author—who again refers to Neubauer's analyses for the proof of the assertion—"*The ammonia of the salts of ammonia, when the latter are taken into the stomach, passes unchanged through the system and is discharged in the urine.*" (p. 223.)

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[1] *Chemical Composition of Ammonia.*

H_3 = 3.0	17.65
N = 14.0	82.35
17.0	100.00

Thudichum.

[2] Ammonia "is the only volatile alkali with which chemistry is acquainted; and of this property we avail ourselves for its analysis."

"*Demonstration of the presence of Ammonia in Urine.*—The ammonia, which has been liberated from urine by means of milk of lime, is made to pass in the form of gas into a solution of sulphate of silver and arsenious acid; the precipitate ensuing is evidence of its presence." (*Thudichum.*)

We have cited the above facts—principally of a chemical and physiological nature—because they are not only interesting, but also have an important relation to the pathological question which presents itself in regard to ammonia considered as a constituent of the urine; and whether its retention in the blood produces any morbid effects. We have not very much to offer upon this portion of the subject; but there are some considerations which are significant. There is a great deal to be learned in regard to the matter—to say nothing of the points in dispute—and principally in reference to the production of uræmia through the agency of *carbonate of ammonia*, as a product of fermentation in the blood. Upon this latter question we have already entered into extensive detail, and have endeavoured to present the actual *status* of the subject, as viewed by many celebrated and industrious observers. We refer the reader to the portion of this essay devoted to *Uræmia;* and will merely add, that all who have examined the facts and theories advanced by Frerichs and others relative to uræmic poisoning, acknowledge the importance of the investigations, and also seem fully aware of the conspicuous position which ammonia would assume as a morbid agent in the human system, if it should ever be proved to possess such a toxic influence as some now accord to it. Dr. Thudichum remarks upon this point: "If what some have ventured to bring forward as a defined feature of certain forms of disease of the kidney can really be maintained, namely, that the urea retained in the blood may there undergo decomposition into carbonate of ammonia, and give rise to the symptoms described as uræmia, the pathological indications of ammonia in the urine would be all-important in those diseases. And though quantities of ammonia might be excreted by the lungs, skin, and bowels, yet the urine would be that excretion in which the ammonia would be most accessible. However probable such a process, under given circumstances, may be, actual and direct proof would be required to make it a fact; and this we cannot say to have been afforded by the originators of the theory. We know, on the contrary, that the test said to be diagnostic of the presence of ammonia in the breath, the formation of white vapours on contact of the breath with a glass rod dipped in hydrochloric acid, frequently fails in cases with the most marked symptoms of uræmia. We must, therefore, expect further proofs, analyses of the blood and the excretions, before we can give that extension to toxæmia as a cause of various severe affections, which by various authors has been attributed to it. It is the same with putrid or septic fevers, under those conditions in which the blood is said to be in a state of dissolution. For all we know, ammonia may be a product of these pathological processes; and then we might expect to find it, in part at least, in the urine." (*Op. cit.*, pp. 224, 225.)

The opinion of M. Claude Bernard, in his late work (*Leçons sur les Propriétés Physiologiques et les Alterations Pathologiques des Liquides de l'Organisme*, Paris, Baillière, 1859), is adverse to admitting that carbonate of ammonia is capable of producing toxæmia. We have referred to this opinion more at length in another place. (See Appendix, Note A.)

The small quantity of ammonia entering into the composition of the normal urine, is, of itself, an element which rather tends to preclude the idea of its accumulating in the blood—in cases of retention of the urinary ingredients—in such quantities as to prove noxious, even if we consider it to be a toxic agent. At all events, under such a supposition, it would require a considerable time for bad effects to arise. And even granting all these conditions, the phenomena springing from retention of the other more abundant constituents would preponderate; unless, by that sort of "elective affinity" previously spoken of, ammonia alone were seized upon and retained in the circulation—the other matters being eliminated and excreted.

Again, it is by no means impossible, although not definitely proved, that ammonia may be essential to the integrity of the blood; in which case, any pathological inferences from its presence, unless occurring in very large and improbable quantities, could hardly be drawn. And especially in view of the fact that the nature of that ferment supposed by Frerichs to be necessary for the production of carbonate of ammonia from urea contained in the blood, is yet unknown, must doubt envelop the whole question, pathologically, until further experiments shall be made, and its existence and real character be ascertained, or its nonentity determined.

In respect to the question as to the necessity of ammonia to the proper constitution and healthy condition of the blood, Dr. Thudichum has some remarks which, under cover of a little pleasant facetiousness, contain valuable hints, and may be appropriately introduced in this connection. Speaking of the elimination of ammonia—ingested into the system in an unchanged state—by the kidneys, he says:—

> "It remains to be seen whether caustic ammonia and carbonate of ammonia are eliminated in a similar manner. It remains, also, to be ascertained whether the organism produces any ammonia under ordinary circumstances, or whether the ammonia in the urine is simply introduced by our food and drink, or by the air which we breathe. Some articles of food are rich in ammonia, *e. g.*, radishes. The smoke of tobacco contains a large share of ammonia; and any person remaining for any length of time in a room filled with this ambrosial offering to Apollo, must inhale such quantities of ammonia as must materially increase the ordinary amount in his urine. If ammonia be really essential to the blood, the anti-tobacco leaguers may yet hear the argument advanced, that tobacco-smoking is really essential to keep our fibrine in solution, and that smoking has of late become so much more common because the ordinary sources of this 'food,' the cesspools, dunghills, and other like accompaniments of human and animal habitations, have been done away with. A still greater amount of ammonia is of necessity inhaled where both the sources just mentioned flow without restraint." (*Op. cit.*, p. 224.)

The fibrine in the blood of a very considerable proportion of the population of America ought to be in a good state of "solution" if the smoking of tobacco be in any degree conducive thereto! Let us hope that such is the effect of "the weed," *viâ* combustion and inhalation!

Several observers have stated the very small amount of ammonia which can be ascertained to exist in healthy urine.[1] Simon (*Chemistry*, Syd. Soc. edit., vol. ii. p. 132) says it "cannot be very easily demonstrated in healthy urine." Liebig (*Lancet*, 1844), referred to by Dr. Day, Editor of *Simon's Chemistry* (*loc. cit.*), pronounced the presence of ready formed ammonia in the urine, as only indicated by "very minute or doubtful traces;" and stated also that "these traces probably pre-existed in the food partaken of." Dr. Day subsequently remarks: "Experiments for the determination of the amount of ammonia in the urine of healthy individuals may become of importance in judging of pathological states; for in fevers and other diseases, the amount of ammonia in the urine increases considerably. It is possible that by analyzing the urine we may, in the increasing or decreasing amount of ammonia, obtain a measure for the alterations which take place in diseases."

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[1] "Ammonia exists only in the urine in combination with the muriatic, phosphoric, and lithic acids." (Prout, *op. cit.*, p. 555.)

As has been previously remarked, there seems not to be a sufficient amount of evidence from which to educe satisfactory conclusions relative to any pathological influence ammonia may have upon the system when present therein in unusual quantity. Those who attach such a distinct power to it in the production of uræmic intoxication and eclampsia, have yet to procure and offer much additional evidence, before their doctrines can be unhesitatingly and fully accepted. The preliminary structure certainly has a fair and plausible appearance, but needs full development and confirmation. We have endeavoured to present whatever is available and reliable upon the present topic, so far as our means of information permit.

The examination of the relations of ammonia to the urine and the blood concludes the plan originally proposed by us in discussing the subject under consideration. It occurs to us, however, that a few words may appropriately be added relative to the *iron* and the *colouring matter* of the urine—*uræmatine.* These we will briefly notice under one head.

IRON AND URÆMATINE.[1]

Iron and uræmatine exist normally together in combination[2] in the urine. Of course, variable amounts of iron must be found at different times in the system, according to the nature and amount of the ingesta; and as the mineral in some of its various medicinal forms is very extensively used, there must be in many persons a large quantity introduced into the circulation.[3] We know the marked beneficial effect of this medication in a large class of cases, especially in those of an anæmic and chlorotic character, and its employment was doubtless owing, first and mainly, to the knowledge of the fact that iron is a normal constituent of the blood. That portion of the vital fluid of which it is an integral part, is, as is well known, the *hæmatine* or red colouring matter. Chemists have been inclined to believe uræmatine "a derivate" of hæmatine, so great is its resemblance to it. (Thudichum *et al.*)

But little that is positive can be said upon this subject, as to any pathological deductions. We can hardly conceive of a sufficient quantity of iron being accumulated and retained in the blood—*if derived merely from the amounts contained in the urine*—to prove injurious. It is not infrequently observed in practice, that only certain quantities of iron can be medicinally ingested, without giving rise to headache, fulness and turgidity of the bloodvessels, with other disagreeable symptoms, principally of a plethoric nature, and which necessitate, of course, a suspension of the medicine, or, at least, a marked diminution of the amount administered. Certain persons, also, are far more easily affected by chalybeates than others. In some, this amounts to a species of idiosyncrasy which precludes the use of such remedies, unless combined with other articles whose employment is often not desirable, and sometimes is inadmissible, for peculiar and varying reasons. Thus, we know persons whom iron, given in any considerable quantity, will *purge* persistently; and in some such instances, if opium be combined with it for the purpose of restraining the action of the bowels, *nausea* takes the place of the diarrhœa—a species of intolerance of the medicament seems to exist. This is doubtless not uncommon. There are other manifestations sufficiently indicative of the powerful action of iron upon the system. But such phenomena, and those more especially mentioned above, are distinctly referable to considerable quantities of iron thrown into the organism at once, or gradually. As we have intimated, there appear to be no sufficient *data* whereupon to found any conclusions in reference to a possible pathological result of retention in the blood *of the iron derived from the urine.*[1]

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[1] *Iron:* Symbol; Fe. Equivalent; 28.0.
Uræmatine: Elementary composition unknown.
Thudichum.

[2] Harley; cited by Thudichum.

[3] Notwithstanding that iron is frequently thus largely ingested, it is a curious and hitherto unexplained fact, that it is not found in the liquid excreta. Its mode of elimination is therefore unknown. Upon this point, M. Cl. Bernard remarks: "Iron is the only substance which exists normally in the blood, which has not been found in the excreted liquids. How is it eliminated? This is undecided. A small quantity only is absorbed even in medicamentary usage. It has been found in the hair; but this is a very slow method of elimination." (*Leçons sur les Propriétés Physiologiques et les Alterations Pathologiques des Liquides de l'Organisme,* Paris, Baillière, 1859, vol. i. pp. 448–9.)

With regard to the curative properties of iron in certain affections, the statements of Dr. Golding Bird have a peculiar fitness to our subject. He says:—

> "Among the remedies which appear most successful when food is not converted into healthy chyle, and an unhealthy state of the blood from the presence of imperfectly assimilated matters results, the preparations of iron deserve notice. I have repeatedly seen copious deposits of uric acid, in persons of low power, completely disappear *pari passu* with the cure of the pseudo-chlorotic symptoms present, by the use of this important drug."

This is literally "killing two birds with one stone," enriching the blood, and depurating it, also. There can be little to fear from *iron* when judiciously administered; it is to be hoped that any "morbid effects" from large amounts existing in the circulation, in whatever way this may be produced, will by and by be satisfactorily and fully ascertained and explained. It would seem, however, that, had any very marked pathological phenomena been constantly, or even frequently, specially dependent upon accumulation from urinary obstruction or failure of due elimination, the acumen of the numerous competent observers of disease, so continually on the watch for such manifestations, would, ere this, have given us some positive ideas upon the subject.

Uræmatine.—There are some interesting observations relative to *uræmatine*, which it seems desirable to present at this time. Uræmatine is believed to be derived, in great measure, from the hæmatine set free during the disintegration of the blood-corpuscles, which is always taking place. *Cholæmatine*, the colouring matter of the bile, is also considered a product of hæmatine. The colour of hæmatine is known to be very persistent. The colour of the fæces and urine is ascribed by Dr. Thudichum to "effete hæmatine." He also alludes to the fact that iron is always conjoined with uræmatine as a component element, and considers this as confirmatory of its origin from the colouring matter of the blood-corpuscles.[2]

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[1] "The analysis of the urine may prove useful for determining the amount of iron which enters the blood and circulation when it is taken as a medicine." (Thudichum.)

[2] For methods of ascertaining the quantity of uræmatine in healthy urine, the

Vogel has shown that the amount of uræmatine is increased in acute febrile diseases; in those which partake of an anæmic or chlorotic nature there is less colouring matter discharged. This is ascribed to the diminution of the disintegration process constantly going on, as has been said, with greater or less activity. In typhoidal conditions, and in fevers of a septical type, there being great dissolution of the blood, the colour of the urine is heightened.

When hæmato-globuline appears in the urine, it is indicative of destruction of the blood-corpuscles, and is a sign of serious import. If only transitory, however, and not recurrent, the case becomes more hopeful. "But when it is a symptom of severe scorbutic or septic disorders, it is a sign of great danger to the life of the patient. Suppression of the urine, and discoloration of the skin, when following the discharge of urine rich in hæmatoglobuline, are also very unfavourable, and are forerunners of a fatal termination of the case." (Thudichum, *op. cit.*, p. 237.)

In discussing a question like that proposed for the subject of this essay, there is much to trammel us, on the score of incomplete revelations of the chemical and pathological elements concerned. The great interest and importance of the theme itself, and of the studies and investigations rendered necessary for its thorough and progressive examination, will more and more rapidly bring hidden truths to light. Practical experiments, and the continued observation of those engaged in medical pursuits, were never more needed than in elaborating the processes and extending the records already so well begun—instituting new methods and employing more profound scrutiny. And especially to those who have the great advantage of being connected with large hospitals, are rare opportunities afforded for these pursuits, destined, as they certainly are, to benefit suffering humanity, by enabling the members of our profession with more facility and certainty, in this class of cases, *prius cognoscere, dein sanare.*

APPENDIX.—NOTE A. *Urea; questions relative to its agency in the system.*

In a lately published work,[1] M. Claude Bernard discusses the question whether urea is to be considered a toxæmic agent, either *per se* or by any product derived from it. The respect which the opinions of this distinguished observer must always command, and the very recent date of the conclusions at which he has arrived upon this subject, induce us to present such of them as are most essential to our purpose.

"Is urea a poison?" asks M. Bernard, referring to the views of Frerichs. A poisonous substance, he goes on to say, although it may, like urea, be present in the circulation, is not necessarily toxic in every, even the smallest amount. "A violent poison may, then, exist in the blood, in very noticeable proportion, without occasioning symptoms of poisoning, if elimination be sufficiently rapid;

amount passed in twenty-four hours, and much valuable information relative to the various shades of colour observed in urine, together with illustrations, see Dr. Thudichum's work. Consult, also, Vogel, "Archiv. des Vereins für gemeinschaftliche Arbeiten," Bd. i. p. 137, 1853.

[1] "Cours de Médecine du College de France. Leçons sur les Propriétés Physiologiques et les Alterations Pathologiques des Liquides de l'Organisme." Par M. Claude Bernard, Membre de l'Institut de France, Professeur de Médecine au College de France, Professeur de Physiologie Générale à la Faculté des Sciences, etc. etc. Paris, J. B. Baillière et Fils, 1859.

we are not, consequently, authorized to declare that urea is not a poison because it is formed in the blood in considerable quantities." (Vol. ii. p. 33.) Bernard then refers to the experiments of M. Gallois, who found the injection of urea into the blood, innocuous, even in large quantities. We must, then, he continues, admitting the fact of innocuousness, seek another explanation. The theory of Frerichs does not seem sufficient, according to Bernard, to account for the phenomena observed. If carbonate of ammonia be injected in small quantity into the vessels, there is no result; and even when introduced into the veins of animals in larger amounts, although an extreme agitation was produced, yet life was maintained. Carbonate of ammonia, moreover, has nearly always been found both in pathological and in healthy blood. "Consequently, its presence in the blood cannot explain the special accidents of uræmia." Bernard therefore adopts another explanation, and puts forward the following views in preference to the others referred to. 1. The condition of the kidneys in advanced renal disease; there is softening, breaking down of the tissue—"fonte putride." 2. By destroying the nerves going to the kidneys, their disorganization is produced; softening and purulent formations are brought on; pus is thrown into the circulation; and thus renal nutrition is wholly perverted, the kidneys becoming decomposed. In this state of things, Bernard is inclined to ascribe the poisoning of the blood and the resulting phenomena to the agency of the putrid matter thrown into the circulation from the injured kidney. He admits, however, that new experiments are necessary. Thus, we ought to see what effects will be produced by injecting the putrid matter from a kidney which has become disorganized by artificial destruction of its nerves, into the blood of a healthy animal—in fact we must ascertain whether the accidents supervening under such conditions will put on the aspect of the nervous phenomena of uræmia.

"There is no physiological office (*rôle*) known as especially appertaining to urea; it is a purely excrementitious substance, not a secretion. It is regularly eliminated by the kidneys; when this elimination is interfered with, we observe the supervention of grave phenomena, without being able to say whether they are, either primarily or secondarily, the consequence of an accumulation of urea in the blood, or whether they are dependent upon the lesion which has caused the accumulation." The phenomena referred to, says Bernard, have received the name *uræmia*. "Is it proper to class under the same category the convulsions of lying-in women?" [as we have seen has been done by Braun and others.] This is a question, according to Bernard, which is yet to be examined, and which it would be premature to pretend positively to answer at present. *En resumé*, Bernard thinks the accumulation of urea, or of carbonate of ammonia, in the blood, cannot explain the disorders alluded to; but that it is far more plausible to believe them referable to destruction or injury of the renal nerves.[1] [This, however, would not explain the so-called uræmic convulsions of pregnancy, since a sort of artificial, or curable, Bright's disease—curable by the act of parturition—may then exist. The question is yet in dispute.]

Dr. E. Brown-Séquard, in the number of the *Journal de la Physiologie de l'Homme et des Animaux*, for January, 1859, makes the following comments upon Dr. Hammond's experiments and conclusions; and we are happy to avail ourselves of this distinguished physiologist's opinions upon this subject, especially in view of the very recent date of their announcement. Dr. Séquard, after giving Dr. Hammond's views and processes, as published in *The North American Medico-Chirurgical Review* for March, 1858, goes on to say: "We shall confine ourselves to the following remarks: 1. The author has not shown so conclusively, as he seems to suppose, the non-conversion of urea into ammonia (he employed hydrochloric acid as a reagent); 2. Injection into the jugular vein, of substances whose action is sought for, is a procedure very liable to make us suppose a non-poisonous substance poisonous, by reason of the disturbance which the injection of any liquid whatever into this vein sometimes produces in the movements of the heart; 3. In dogs from whom the kidneys have been removed, the injection of four ounces of pure water is capable of producing the same morbid effects which the author observed after injecting the different salts and urea, contained in four ounces of water. We conclude, then, that Dr. Hammond's experiments, exceedingly interesting though they are, are not sufficient to overthrow the ingenious theory of M. Frerichs. Of the two divisions of this theory, that which considers urea not to be a poison, or, at least, not to be capable of producing uræmia, seems scarcely to be shaken by the experiments of Dr. Hammond. As to the other division, according to which uræmia is a poisoning due to the carbonate of ammonia, more powerful arguments than those we have cited above have already been urged against it, and, at the present time, it seems very probable that uræmia is an aggregation of symptoms dependent upon various causes, among which, poisoning by carbonate of ammonia has only a variable proportion of influence.

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[1] For Bernard's remarks, *in extenso*, see the work cited, vol. ii. pages 34—37 inclusive.

"The experiments of M. Gallois (*Thèse inaugurale*, Paris, 1859) may be considered more positive than those of the American physiologist, in showing that urea is a poison. M. Gallois has seen rabbits die, after violent convulsions, from the administration of twenty grammes of urea, introduced into the stomach. But we have no proof that urea is not transformed into carbonate of ammonia, or into some other toxic element." (*Loc. cit.*)

M. Guérard (*Dict. de Médecine*, in 30 vols., Art. *Sang*), referring to the accumulation of urea in the blood, thus writes: "This accumulation in the blood of a principle whose elements are endowed with such an excessive mobility, and which separate themselves with the greatest facility in order to transform themselves into carbonate of ammonia, eminently deserves to arrest the attention of physiologists, on account of the accidents to which it will unfailingly give rise." He then asks, "if it be not probable that the ammoniacal odour pervading the excretions of those who have long had suppression of urine, is the result of the metamorphosis mentioned? The plausibility of this opinion becomes greater if it be remembered that many observers have assured themselves of the existence of urea in the fluids effused into the various serous cavities, in persons who have died of Bright's disease." M. Guérard refers, in this connection, to Dr. Babington. (*Cyclopædia of Anatomy and Physiology*, Art. *Blood.*)

NOTE B.—*The Relation of Uric Acid to Gout.*

Dr. Barlow (*A Manual of the Practice of Medicine*, London, 1856), referring to the explanation given by Dr. W. Budd (*Medico-Chirurgical Transactions*), in respect to the elective affinity manifested by certain morbific matters for certain organs and parts of the body, speaks of the support which the humoral pathology of the various gouty affections may reasonably derive from these views; but he is by no means inclined to allow uric acid the important position of chief agent in the production of gout. He says: "It is not, however, intended to imply by what has been said, that lithic or uric acid is the alone or efficient cause of gout; for if this were true, we should always have gout when uric acid is in abundance [not so, we would remark, if it be in process of elimination, and is not *retained* and *accumulated in the blood*—for such are the elements evidently required for the production of the disease], and never have gout without it; whereas, the presence of the one without the other, especially of uric acid without gout, is a matter of everyday experience." [For the reason above alleged; for if uric acid appear in abundance in the urine, we infer from the fact alone, as a rule, its free elimination; consequently, it does not accumulate in the blood, and gout does not occur.] Dr. Barlow continues: "Upon what the gouty diathesis or susceptibility depends we know nothing [?]; it manifests itself in the system by an affinity for the gouty poison (uric acid it may be) in different parts. If this diathesis be such as to produce an affinity of extraordinary intensity, there may be a local excess of this substance, without any such excess, or even with a deficiency, in the system at large, just as there may be a local hyperæmia, although the general state of the system may be anæmic. This explanation of the difficulty is merely suggested as possible, not enunciated as certain; it nevertheless derives confirmation from the recent observation of Dr. Garrod that uric acid is present in the serum, effused when a blister has been applied over a joint affected with gouty inflammation." (*Op. cit.*, English edition, 1856, p. 143.) Aside from the force of the evidence adduced by Dr. Garrod in the test referred to by Dr. Barlow, we cannot think the position of the latter author is strengthened by the analogy which he attempts to establish—or the similarity which he would imply, in vital action—between local hyperæmia in general anæmic states and the deposition of urate of soda by elective affinity. In fine, in the one case, the blood, although deteriorated, does not, in the circumstances proposed, contain a poison; whereas, in the latter case, it does, or the local manifestations thereof would not occur. Mere local hyperæmia, occurring as above mentioned, cannot be properly compared with the local exhibition, by vicarious action, of the product of an abnormal amount of uric acid in the blood.

REVIEWS.

Art. X.—*A Practical Treatise on Phthisis Pulmonalis; embracing its Pathology, Causes, Symptoms, and Treatment.* By L. M. Lawson, M. D., Professor of Clinical Medicine in the University of Louisiana, &c. Cincinnati, 1861. 8vo. pp. 557.

The Forms, Complications, Causes, Prevention, and Treatment of Consumption and Bronchitis: comprising also the Causes and Prevention of Scrofula. By James Copland, M. D., F. R. S., &c. London, 1861. 8vo. pp. 440.

Leçons Cliniques sur les Causes et sur le Traitement de la Tuberculisation Pulmonaire, faites à l'Hôtel Dieu (1859). Par Noel Guéneau de Mussy. Paris, 1860. 8vo. pp. 134.

The Physical Examination of the Chest in Pulmonary Consumption and its Intercurrent Diseases. By Somerville Scott Alison, M. D. London, 1861. 8vo. pp. 447.

It would not be surprising that a disease to which one-sixth or one-seventh of the total mortality is owing in a large portion of the civilized world, should form a favourite subject of investigation, were it not that all the genius and industry expended upon it, and all the suggestions of new or modified methods of treating it, have hitherto produced no sensible decrease in its ravages. The discouragement inspired by such reflections tended, no doubt, to limit the number of special treatises relating to it until the introduction of physical methods of examining the lungs rendered the distinction of curable and incurable diseases of these organs comparatively easy to duly instructed observers. The brilliant inventions of Auenbrugger and Laennec gave a new motive to the study, by shedding upon it a novel and unsuspected light, and, illustrated by the cotemporaneous discoveries of morbid anatomy, revealed every step of the process, from the primary alteration of the blood, to the complete disorganization of the lungs, in which the material evidences of the disease consist. When there was apparently nothing more to learn of the grosser elements of phthisis, and the revelations of the microscope and of chemical reagents no longer excited the same hopes, which at first they inspired of penetrating the arcana of its pathogenesis, the disease acquired a fresh interest, and this time a more humane one, in the awakened hope of its curability by medicinal and hygienic means. Naturally enough this latest phase of the subject has been attended with a corresponding activity in the ranks of pretenders to medical knowledge; and for every well founded yet cautiously expressed hope which physicians have ventured to utter, a score of downright assertions, equally false and positive, have issued from the brazen throat of charlatanism.

So thoroughly has the whole subject been examined that little now remains, either in regard to the natural history of phthisis or the value of remedies in its treatment, beyond correcting the errors and more precisely limiting the truths of the one, and rendering the other more generally useful. Not that there are not questions still undecided in regard to it; but, unless it should enjoy a peculiar immunity from the lot of all other subjects, upon which the reason can be exercised, this must always be the case, and the substantial agreement of physicians, both in doctrine and practice, will render such dissidences unimportant. Each practitioner, and each writer on consumption, will entertain views peculiar to himself, and hence every work upon the subject is almost necessarily, and to some extent, defective or erroneous. In forming, therefore, our own medical opinions, in so far as they are to be moulded by books, we must be careful lest, in accepting the sound doctrines they contain, we should become infected by their errors. Against this danger there is no surer protection than in comparing the published results of observation and reasoning with one another. Did we possess a personal knowledge of the writers' character, it would render unnecessary any attempted estimate of their probity, and we should at once reject their evidence, or accept it confidently; but restricted as we chiefly are to the written evidence of their veracity, we cannot do better than adjust their claims to instruct us by their degree of consistency with themselves and with each other.

The most important among the works whose titles are prefixed to this essay, is that of Dr. Lawson. It is the first systematic treatise upon consumption of the lungs, by an American author, and we do it but justice in stating our opinion that it is not inferior to any other in the English language, whether for completeness of elucidation, general accuracy of statement, or a thorough comprehension of the subject. It is written, also, in a style at once simple, clear, and correct,[1] and bears throughout the impress of its author's honest convictions. Indeed, taking it for all in all, it is a work which every practitioner may use as a trustworthy guide in forming his opinions, and directing his treatment in nearly all the forms and stages of tuberculous phthisis. If we thus slightly qualify our general judgment, it is because upon certain points we consider the work to be open to criticism. These we shall particularly examine, on account of their great general interest and practical bearing, as well as because they occur in the work immediately before us.

Dr. Copland's treatise is substantially the Essay on Pulmonary Consumption contained in the third volume of his *Dictionary of Practical Medicine*, and, as such, it must be presumed to be familiar to our readers. It is essentially a compilation, and although very carefully and diligently made, does not present as thoroughly digested an account of the actual condition of this department of medicine, nor as much original observation as we should have expected from a physician of so much eminence as its author. The volume also includes an essay on bronchitis, which it is foreign to our present purpose to notice.

The little work of M. Guéneau de Mussy is an admirable specimen of a certain class of clinical lectures, in which a group of cases merely serves as the text for a didactic discourse upon a particular disease. This departure from the true method and purpose of clinical teaching, which should deal with individual cases only, may sometimes be pardoned when, as in the present instance, it is not only elegantly and eloquently executed, but serves as an occasion for illustrating some important truths.

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[1] Several barbarous orthographical errors which must be charged, we are sure, to the printer, offend the eye, *e. g. fiber* for fibre; *mold* for mould; &c. The formulæ are sometimes combinations in various proportions of English and of pharmaceutical Latin. They should be one or the other exclusively.

In another part of this review we have quoted some not very tender objurgations of Dr. Copland against those writers who put too fine a point upon the art of physical diagnosis, and who "a hair divide 'twixt north and northwest side," in their classification of râles and murmurs. If the eminent author had not written his diatribe until after the appearance of Dr. S. S. Alison's work, who can tell what fulminations he would have launched against it? A volume of four hundred and fifty pages, on the physical examination of the chest in consumption and its intercurrent diseases only! Surely the learned author of the *Dictionary of Practical Medicine* would have found the outrage intolerable, or a bane only to be endured when an antidote was at hand, in the shape of Dr. Chambers' "Drill for Auscultation," where the whole art and mystery is condensed within the limits of a single page, which concludes with this magistral sentence: "All besides this is fancy work, showy, but waste of time."[1] Extremes meet, it is said, and certainly the proverb holds in the present case; for, except as furnishing mere indications for the accomplished adept in physical diagnosis, Dr. Chambers' "Drill" is as useless to the student as the complicated, elaborate, and minute treatise of Dr. Alison, in which the true grain lies buried in a bushel of wordy chaff. But while thus expressing the feeling of exhaustion with which we have waded through his work, stumbling at every step over new-fangled terms which only serve to embarrass the reader, how much soever they may illustrate Dr. Alison's familiarity with his subject, we should be very unjust were we not to accord him a higher place in this department of medicine than is held by any English writer, with the single exception of Dr. Walshe, or to give him credit for remarkable ingenuity in the invention of useful instruments for the exploration of the thoracic organs. Indeed his single improvement of the bin-aural or double stethoscope, (which in its simpler form he justly ascribes to an American physician, Dr. Cammann,) with the remarkable results of its use which he describes, would of itself entitle him to very high commendation. To all advanced cultivators of pulmonary and cardiac pathology, we very sincerely recommend his work, being well convinced that they will find it full of useful, and not a little new information. They can afford to look leniently on its neologisms and forms of expression which no laws of the English language tolerate; *e. g.* "sensorial silence;" "synchronosity;" "*more* annihilating;" "ill pronounced bruit;" "dividedness;" "inflatability;" "bronchnœa" instead of bronchopnœa, for bronchial respiration; "feeble pipe respiration;" an act of "uno-aural audition;" "constrictive character of sound;" "loudish" sound; &c. They can even smile at such original comparisons as "a degree of firmness and resistance such as that of the white part of a loaf of bread two days after it is baked;" or "as firm as the usual plum pudding;" or when they are told of "the loud, forcible, *solid* voice;" that in pectoriloquy "the *letters* of each word seem to be distinctly articulated;" that a percussion blow "is lost *quoad* the lung and air tubes;" of lung "thickly *incorporated* with tubercle;" of "a *quasi* cracked pot sound;" of "an angle of 180°;" and immediately afterwards of "the angle of a straight line" although the qualifying "so to speak" is prefixed to the latter phrase. The uninitiated reader would be somewhat puzzled to explain "a double flattened chest" and "a single flattened chest;" and Laennec would bounce in his grave at the sound of "buzzing, humming, arrow-root, yarn-tearing, fine rolling, and shell bruits." These and a multitude of similar originalities might pass muster, "so to speak," at the bedside, or even in the lecture-room, but they disfigure a didactic treatise, and are altogether unworthy of an M. D. Edin., F. R. C. P., who dates his preface from Grosvenor Square.

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[1] Lancet, March, 1861, p. 307.

It would be easy to lengthen the list of recent works on phthisis, some of which have received the imprimatur of recognized critical authorities, but which are really destitute of every scientific and every moral claim to respect; while others are so redolent of knavery, that when they apply to the "Reviews" for recognition, even the gentlest Aristarchus is compelled to thrust them out of doors.

The term phthisis, which is now restricted to tubercular consumption, was formerly applied to every wasting disease of fatal tendency, and the word tubercle, which at present only signifies a specific morbid deposit, was once used to describe every small and rounded body or projection. Under the name of laryngeal phthisis, Trousseau and Belloc included several different affections, and Dr. Horace Green, of New York, described enlarged follicles as "tubercular," which had nothing in common with tubercles but their shape. The former error was unavoidable in the existing state of pathological knowledge, but the latter is opposed to the conclusions of science, and is employed to support a doctrine not less erroneous in fact than deceptive and pernicious in its practical results. Tubercle is a peculiar morbid product, which is incapable of any higher development, and tends either to a retrograde metamorphosis into calcareous matter, or to softening and elimination.

Dr. Lawson, after describing the physical characteristics of gray and yellow tubercle, says:—

> "It may fairly be questioned whether these products in fact belong to the same class, or whether they are not radically distinct in origin, essential characters, and ultimate tendency." (p. 34.)

Dr. C. Radclyffe Hall has also asserted this distinction in terms quite as clear and emphatic, declaring that when semi-transparent tubercle becomes opaque, and proceeds towards softening, it does not become cheesy like the tubercle, which is yellow from the first; that tubercle *may* be opaque and yellow from the first; and that, according to Rokitansky, "gray tubercle never changes into yellow."[1] Whatever qualified opinion the eminent pathologist just named may once have entertained upon the last point, there can be no obscurity about his more matured opinion. We find in the last edition of his *Pathological Anatomy*:—[2]

> "There remains no doubt that, as Laennec taught, gray is transformed into yellow tubercle. . . . The metamorphosis may commence so early, and advance so rapidly, as to make it seem as if the tubercle had been originally formed opaque and yellow."

Lebert's view differs but slightly from this. He says: "Semi-transparent gray granulations are from the first decidedly tuberculous." Yet he adds that he has found in the lungs yellow granulations so minute as only to be rendered visible by a magnifying power of from ten to fifteen diameters, and consequently that they *might* have been deposited originally as yellow tubercles.[3] Yet there is no evidence that these bodies, minute as they were, might not originally have been semi-transparent. There is, rather, a strong probability that they were so, for there is no reason why they should not have undergone the same changes which evidently take place in larger tubercular deposits. The greater includes the less.

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[1] Br. and For. Med. Chir. Rev., Oct. 1855, p. 465.

[2] 3d ed., 1855, i. 296.

[3] Anat. Pathol., fol., i. 329.

Rokitansky, as will be seen below, goes so far as to describe the peculiar changes which take place in the appearance of tubercle, in passing from the gray to the yellow state, the perfect development of the one, and the shrunken and withered aspect of the other; and Dr. Bennett states that the two varieties are composed of similar elements, which are more transparent and less perfectly defined in the first than in the second sort of tubercle.

Our author states that Bayle, who originally described these gray granulations, evidently regarded them as different from ordinary yellow tubercles. But, as Dr. C. R. Hall has shown, Bayle considered to be tubercles such nodules only as were opaque, and by his "granulations" there is to be understood "nothing more than isolated, often thickly disseminated gray tubercles, which happen to be unusually small, hard, and transparent." Dr. Lawson also maintains that "gray semi-transparent granules are inflammatory products," and gives this as one among his reasons for holding them to be different from yellow tubercles. But he qualifies this, which sounds like a rather bold assertion, since Broussaisism is dead and its cabalistic word "inflammation," which was by turns everything or next to nothing, has lost its conjuring power, and he implies, if he does not in so many words declare, that phthisis is a disease of the constitution, and that any cause which debilitates the constitution may provoke the deposit of tubercles. It is not singular, then, that local congestions should occasion an exudation of the aplastic substance with which the blood is charged; and thus that inflammation should become the occasional, but in no wise the efficient cause of tubercular deposits. In other parts of his work (pp. 145, 176, 395), Dr. L. expressly refutes the idea of the inflammatory origin of yellow tubercle; and we think that if he had more carefully weighed the facts of the case, he would have been less inclined to conclude that semi-transparent granules are different from yellow tubercle in this respect. For if it is certain that these granules always precede yellow tubercles, and if the cases where the former exist alone are exclusively those in which death takes place at so early a period after the commencement of the symptoms, that time for the transformation has been wanting, there is no reason whatever why we should not regard gray semi-transparent granulations as identical in nature with yellow tubercles, and differing from them only as the ripe from the unripe fruit, to use Laennec's comparison.

The histology of tubercle is discussed by Dr. Lawson in a carefully prepared chapter, and gives evidence of his own attentive examination of the subject; yet we think that he errs in taking the yellow form as the type of tubercle, when the most authoritative investigators have concluded that it is an altered if not a degenerated state of the original deposit. Rokitansky says of this variety: "It consists essentially of nuclei measuring from $\frac{1}{125}$ to $\frac{1}{100}$ mm. in diameter, which are held together by a viscid cement. There are, besides, uni or poly-nucleated cells, *i. e.*, mother cells which denote an endogenous development and multiplication of the first mentioned elements." (Op. cit., 3d ed.) And, further, in describing the yellow variety, he uses this language: "It consists of a great number of protein molecules in which the elements of the gray tubercle appear turbid, have a yellowish lustre, and are shrivelled, wrinkled, and jagged, and in part, as it were, corroded. These are Lebert's tubercle corpuscles." Our author includes Rokitansky among pathologists who describe nuclei as being occasionally, but not constantly, present, whereas it is evident from the above quotation that he regards them as normal constituents of tubercle. Dr. Lawson also states that Lebert is one of those "who deny the existence of nuclei," whereas, the words of the latter are "*rarement* on y voit de véritables noyaux."[1] This was also the opinion expressed by Rokitansky in the first edition of his work; but it will be seen by the above quotation that he now attributes to tubercle elements which are peculiar to bodies capable of growth, a conclusion which few will adopt, because it appears to be incompatible with the uniform tendency of the tubercular deposit to a more and more degraded condition. The elements referred to by this author are peculiar as well as indicative of an inherent power of growth, but Dr. Lawson, while admitting them to be organic but non-vascular bodies, describes them as being wholly unlike the corpuscles of any other product healthy or morbid, or, in other words, as a specific formation. Dr. Ellis, on the other hand,[2] pronounces these corpuscles to be only shrivelled cells or free nuclei, and that, indeed, tubercle has no special structure. Yet, unable to resist the clinical evidence of the peculiarity of tuberculosis as a morbid process, he attributes to tubercle powers independent of its ascertained physical constitution, illustrating his idea by a reference to the operation of morbid poisons, as syphilis. It is evident, from this brief statement of the discordant facts and opinions of those who have most carefully studied the subject, that the essential nature and even the primary physical conditions of tubercle are virtually unknown.

The mode of development of tubercle is very clearly, and as we think correctly, described by Dr. Lawson. First there is (within or without the pulmonary cells) an exudation of a blastema, in which granules or cytoblasts appear; then each cytoblast becomes invested with a cell membrane, and the organic element of tubercle is complete. The cell, however, possesses life by means of which it is capable of absorbing nutritive material for a limited period, until finally, its vitality being exhausted, disintegration results. This change takes place just in the centre of the mass, because, being farthest removed from the vascular influence, it will be the first to feel the effects of age. As to its nature, Dr. L. adopts the view that it consists essentially in fatty, or, as Virchow calls it, cheesy degeneration. This idea was, we believe, originally suggested by Mandl,[3] who refers to various examples of a similar change which takes place in muscle and other tissues when their vitality is greatly lowered. It is not to be lost sight of, moreover, that in the formation of adipocere, even dead animal matter is susceptible of conversion into a new substance by the operation of moisture alone. The idea that semi-transparent tubercle is essentially different from the yellow form will perhaps account for the absence of any clear account of the origin of yellow tubercle in Dr. Lawson's work, but nearly all other writers agree that gray tubercle gradually grows yellow, the change of colour beginning in its centre, that it then loses its firmness, is impregnated with moisture, and finally is disintegrated and liquefied. As Dr. C. R. Hall has remarked, softening of tubercle essentially consists of two combined modes of disintegration—fatty degeneration and liquefaction.

In the section on cretaceous transformation, Dr. Lawson calls attention to the frequency with which this condition is found in the lungs of persons who die of phthisis, and who have also expectorated cretaceous tubercles. The fact should be particularly borne in mind by those who, in their method of treatment, appear to forget that the pulmonary lesions in consumption are merely the local expression of a cachexia involving the whole economy. In another section the possibility of absorption of tubercle while in a fluid state is held to be a possible event. It is admitted that a demonstration of such a result is in the nature of things impossible, but it is suggested that since tubercle is transmissible through the walls of one set of capillaries, it may return to the circulation through another class. It is not easy to imagine what would be the gain of such a process, for the constitutional cause which determined a first exudation would occasion a second. Besides, it must not be forgotten that it is probably much easier for capillary vessels to secrete a liquid than to absorb a solid, which tubercle becomes immediately it is deposited. Virchow contends that tubercle, after having undergone a complete fatty metamorphosis, becomes capable of reabsorption. Our author alleges that in some cases of commencing phthisis the signs of a certain extent of consolidation may be present at the apex of the lung, which will afterwards be found to indicate a less degree of this change, from which he infers the possibility of the absorption of a tubercular deposit. A similar remark has been made by others. But they seem to forget that the signs in question may all depend upon a limited pneumonia which is excited by the presence of the tubercles, and assumes that subacute form which intercurrent pneumonia of limited extent affects. That such is often the cause of a temporary aggravation of the symptoms and an extension of the space embracing the characteristic physical signs of solidification cannot be called in question. It is also conceivable that in acute tubercular infiltration the liquid portion of the effused blastema may be absorbed; but there is no reason to suppose this possible in reference to the proper tubercular elements; and, moreover, this exudation which usually occurs at the apex of the lung takes place in the primary development of the chronic disease, and therefore slowly and not probably in sufficient quantity to occasion the physical signs in question. When clicking and dry crackling sounds are alone temporarily increased, without any corresponding increase in the area of dulness, we have been accustomed to attribute the phenomena to a limited tubercular capillary bronchitis, which would seem to be a more probable explanation than the presence of a glutinous exudation of tubercle in the air-cells. We are quite willing to admit, hypothetically, the possible occurrence of physical signs of tubercle at the apex of the lung followed by their total disappearance, and depending upon a tuberculous exudation in its primary form, because pathological anatomy exhibits to us occasionally cretified tubercles which have failed to furnish any physical evidence of their presence; but we repeat that there exists no clinical evidence whatever to show that tubercle once formed can ever be removed by absorption.

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[1] Anat. Path., fol. i. 332.

[2] Am. Journ. of Med. Sci., April, 1860, p. 411.

[3] Archives Gén., 5e sér., iii. 414.

Dr. Lawson is of opinion that the cretaceous transformation of tubercle is only due to the absorption of its animal matter, and not at all to the substitution of mineral elements. The latter is, however, the opinion of Copland, and by inference that of Lebert; and we cannot see why it should not be true when we consider how numerous are the cretaceous transformations of fibrinous exudations, and various tumours, including hydatids of the lung in the lower animals, as Mandl points out. Thénard found that crude tubercle contains only three per cent. of mineral matter, while calcified tubercle contains ninety-six per cent. It has, indeed, been suggested that this proof is insufficient unless we know that the original tubercle had not dwindled in size to a corresponding degree. That it should have been originally thirty times larger, which the explanation requires, is, however, totally incredible. Moreover, as Dr. C. R. Hall remarks, among tubercles on serous membranes we frequently find a calcareous nodule as large as any of the neighboring little tubercles, in which it is plain that there is more of earthy matter than could have belonged to the original deposit.

Dr. Lawson describes with great clearness and accuracy the formation of cavities, and the condition of the bronchi and pleura, but omits all notice of the laryngeal lesions. In speaking of the distribution of the deposit, he distinguishes between "true tubercle" and semi-transparent gray granulations, as he does in those portions of the work already noticed, and we cannot but repeat that this view is at variance with the most authoritative teachings of pathological science. In the chapter on pneumonia in its relations to phthisis, the modifying influence of the tubercular constitution and of tubercular deposits upon the grade of pneumonic inflammation is well portrayed, and a distinction correctly drawn between this form of pneumonia and that more limited inflammation of the lung which is directly excited by the presence of tubercles. We cannot, however, subscribe to the statement that pneumonic inflammation of the apex "is observed in the mere *diathesis*, anterior to the development of tubercles." The proof of such a proposition would, we suspect, be difficult to furnish. It would be scarcely less so to demonstrate that in many cases the extent of tubercular deposits in the lungs is regulated by pleuritic adhesions. Such is the author's statement in opposition to the settled belief that pulmonary tubercles themselves excite pleurisy, and very generally to an extent equal to that which they occupy in the lung. He believes rather that the diminished action of a lung compressed by a pleuritic effusion favours the deposit of tubercle within it. But the two propositions do not necessarily exclude one another. Of the first an all-sufficient proof is the extreme rarity of pleuritic adhesions of the upper lobe of the lung independently of tubercle in that part. The danger of tubercular pleurisy is undoubtedly great, as every medical observer will attest. But Dr. Lawson says: "We can scarcely assent to the conclusions of Louis, when he asserts that, with one exception, he *never* knew it entirely cured!" Upon this it may be remarked, first, that Louis does not state a conclusion, but a fact, and further that he expressly qualifies his statement by the remark: "Of course I refer only to grave cases of pleurisy, such as are accompanied with more or less effusion; as for dry pleurisy, it is probably without influence on the progress of the disease." The influence of pleuritic effusion upon the condition of large cavities is occasionally favourable; the compression of the affected lung tends to diminish the wasting discharge, and, under favourable circumstances, may even promote the cicatrization of the part. Two cases are reported, the one of pleurisy and the other of pneumothorax, in which this effect seems to have been produced.[1]

We may here remark that in the work before us no special notice is taken of pneumothorax in connection with phthisis. Speaking of *emphysema* in phthisis, Dr. Lawson, after alluding to the obliteration of the cells by tubercle, says: "Following this condition the adjacent parts take on increased action, and finally become emphysematous." This statement does not harmonize with a previous and correct one that emphysema generally occurs in parts of the lung free from tubercular deposits. Besides, it is difficult to comprehend how any portion of a lung can "take on increased action." Undoubtedly dilatation of the vesicles in phthisis is attributable chiefly to the mechanical effect of coughing. Dr. L.'s observations agree with those of Louis and Rokitansky, in showing the heart to be smaller than natural in phthisis. It is difficult to comprehend how an opposite conclusion could have been arrived at by Hasse and Dr. Boyd.

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[1] Med. Times and Gaz., Aug. 1860, p. 108.

The chapter on the *nature of phthisis* affords a very favourable display of our author's literary research and critical skill. He deals very justly, if not always very gently, with the hypotheses invented by ingenious men to give a scientific colouring to their speculations or their practice. He thus condemns in succession the theory of impaired primary digestion, those of an imperfect development of chyle, of a morbid condition of lymph, of defective respiration, of morbid states of the blood, of a specific poison, of changes in the condition of the albumen and fibrin, of retrograde morphology, of derangement of the organic nervous power, and of inflammation. A very curious piece of reasoning upon this subject is of frequent occurrence in the writings of distinguished medical authors. Many of them speak of scrofula and consumption as if they were essentially the same disease; and, among the sub-titles in Dr. Copland's work, we read "the prevention of the scrofulous taint, the chief source of consumption," yet this writer agrees with Dr. Lawson, Dr. Walshe, and indeed almost every competent authority, in declaring

> "That the manifestation of scrofulous or tubercular disease in the bones or glands, &c., in childhood or youth . . . generally prevents the occurrence of tubercular consumption." (p. 173.)

It is very true that the microscopic and chemical as well as the gross physical qualities of scrofulous matter and tubercle are the same; but the entire symptomatology of scrofula is different from that of phthisis, the one affecting the lungs almost exclusively, and the other quite as exclusively being seated in organs in which tuberculosis apart from phthisis is rare, as the joints, the eyes, the skin, the subcutaneous cellular tissue, and the mucous membranes. Childhood is the age of scrofula, manhood of consumption; Northern and Middle Europe is the region where scrofula and phthisis both abound; while in this country, where the mortality from the latter disease is not less than on the other side of the Atlantic, scrofula is comparatively a rare affection among the native population. As Lebert declares,[1] there is no identity between the two diseases.

The most plausible of the theories above referred to is that of impaired primary digestion.

Morton[2] enumerates among the symptoms which denote the imminence of phthisis, a continued want of appetite without apparent cause, inability to digest the food, and, if much is eaten, oppression at the stomach and weariness of the limbs. This, he adds, "is the very symptom that opens the way to a consumption." Dr. Copland refers to Tissot, as having indicated the relations of indigestion to consumption, and quotes from Dr. A. Smith a passage which appears to warrant this statement. But, on referring to Tissot's works,[3] we find that the first portion of the quotation has no reference to pulmonary or digestive disease, but only to mental excitement; and the second is a paraphrase of a passage in which, indeed, vitiated blood is said to be a cause of consumption in persons of sedentary habits, but there is nothing to imply that its vitiation is the effect of indigestion. Dr. Copland, however, holds that indigestion is an early attendant upon all the forms of the malady, but by this he does not so much imply gastric dyspepsia as deranged assimilation and nutrition, a condition which, we presume, can only be inferred to exist by the occurrence of emaciation. Dr. E. Lee[1] tells us that many children and many patients who have passed the age of puberty become consumptive although digestion is well performed, and on the other hand but few dyspeptics become consumptive, unless predisposed to the disease, or exposed to some one of its active causes. Dr. Walshe says: "I have not met with any marked illustration of the lamentable details concerning phthisical dyspepsia supplied by some authors," but he coincides with Dr. Copland in recognizing the patent fact that the secondary processes of digestion are at fault. We can but repeat that this fact is expressed in ordinary language by the word emaciation. Dr. Budd has carefully described the gastric derangements accompanying phthisis,[2] as Louis had long ago done; but neither of these writers refers to dyspepsia as preceding the pulmonary and general symptoms of consumption. Dr. Flint has observed no connection between dyspepsia and tuberculous disease of the lungs, but on the contrary is disposed to regard the existence of the former as rendering that of the latter improbable.[3] De Mussy remarks that indigestion is a symptom common to all serious diseases, whether acute or chronic, and although it often attends the commencement of phthisis cannot be said to produce it.[4]

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[1] Handbuch der praktischen Medicin, I. 511.

[2] Phthisiologia, p. 70.

[3] Œuvres Compl. tom. iii. p. 28 and p. 58.

Our author has examined this question with particular care. He points out the want of agreement among those who adopt the affirmative, and dwells upon the conclusive fact, cited as we have seen by others, that, as a general rule, dyspepsia does not exist in persons who become the subjects of tubercular consumption, and that on the other hand dyspepsia is an extremely common disease where there is no evidence either of the diathesis or of the existence of phthisis.

> "We feel authorized," he concludes, "to reject the gastric theory as wholly incapable of explaining the origin of many, or even of any large proportion of cases of phthisis; but, as a mere symptom, or in a therapeutical point of view, the derangements of digestion become vastly important."

As for the theory which refers tuberculosis to a defective elaboration of chyle in consequence of a disturbance of the normal relations between fat and albumen, which is supposed to result in the imperfect formation of the chyle-corpuscles, a theory which has been very ingeniously advocated by Dr. Bennett, our author very pertinently objects to it that we have no proof of the assertion that tubercle depends on an absence of the fatty element, or that an excess of acid exists in the stomach of persons attacked with phthisis, so as to impede the assimilation of fat. He might have added, further, that many consumptive patients do perfectly digest fatty food, and increase in weight by the use of it, while all the time the tuberculous degeneration of the lungs is steadily advancing.

While rejecting the theories above referred to as sufficient explanations of the origin of tuberculosis, Dr. Lawson very properly concedes the occasional agency of the causes which they embrace in developing the disease, while he regards them as being still more commonly effects or symptoms of the primary lesion. His own speculations upon this subject constitute a very interesting episode in the work, and are adapted to inspire an extremely favourable opinion of the author's pathological knowledge and dialectic skill. A brief summary of them will not be uninteresting.

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[1] Fiske Fund Prize Essay, p. 35.

[2] Med. Times and Gaz., Aug. 1858, p. 131.

[3] Dis. of the Respiratory Organs, p. 496.

[4] Op. cit., p. 30.

Dr. Lawson sets out by selecting for examination those cases only of phthisis in which the disease has been developed by its own inherent power rather than under the influence of external causes. All matters contained in the blood, and which cannot be assimilated, are eliminated through certain organs rather than others, *e. g.*, the typhoid poison through Peyer's glands, that of the eruptive fevers proper through the skin, diabetic sugar through the kidneys, &c. In each of these diseases we see the same group of phenomena recurring in the same way, and hence we must conclude that in each case a specific cause is in operation. Now tuberculosis is a specific affection, and very probably, though not demonstrably, tubercle is a specific materies morbi. It certainly is "a specific or peculiar product wholly unlike fibrin, albumen, casein, or other known compounds." Dr. L. shows that it does not originate probably in the chyle or the blood, and consequently that it must have its origin in the metamorphosis of the tissues. The products of this process are nitrogenous and carbonaceous; the former are eliminated by the kidneys, and the latter in part by the lungs. Here the author concludes, that the metamorphosis of the tissues may give rise to an elementary form of tuberculous matter of so subtle a character as to elude the researches of the chemist and the microscopist, but which may accumulate in the lungs. He admits that this is a hypothetical view, but adduces in its defence the analogies drawn from diseases admitted to depend upon a virus, which, however, cannot be detected in the blood, and also the observation that even when urea is known to exist in the blood of animals subjected to appropriate experiments, a certain time must be allowed for it to accumulate after its escape from the kidneys has been prevented, before its presence in the circulating fluid can be demonstrated.

The identity or close similarity of scrofula and phthisis, which he maintains in common with the greater number of pathologists, but in opposition to Lebert and others, furnishes an argument in support of his doctrine. In the latter, he affirms, the morbid element enters the venous radicles and reaches chiefly the lungs; in the former, it enters the lymphatics and affects the glands. Now, as the two affections rarely coexist, as indeed for the most part they occur originally at different periods of life, it is not improbable, says Dr. L., that the manifestations of scrofula in the skin, glands, &c., may save the lungs from a development in them of tubercles. He does not suggest any reasons why the two forms of disease should occur at different ages, but one might perhaps be found in the great development of the lymphatic system in youth; nor does he consider the obvious objection, that tuberculosis, as distinguished from scrofulosis, is very common even from intra-uterine life through all the stages which precede adult maturity.

The formation of a specific tubercular substance, and its elimination without deposit in the tissues, constitutes for Dr. L. the "precursory stage" of phthisis, and it would be quite consistent with the hypothesis to suppose that accidental circumstances, and among them inflammation of the lung substance itself, might cause a deposit of tubercle which else would have escaped. This, however, our author does not venture to assert, but candidly admits that the deposit is not the product of ordinary inflammation. We would suggest that it is in accordance with his hypothesis that tubercular deposits should occur most frequently at the summit of the lungs, for that is the part least moved during respiration, and further that the disease is pretty certainly most common among those persons whose habits are inconsistent with the free play of these organs.

The conditions which favour the development of tubercle, or, in general, the *Etiology of Tuberculosis*, forms a very interesting chapter in the history of the disease, and one indeed which calls for even a more thorough study than the disease itself, because from it we may perhaps learn how to prevent what our therapeutic means are incompetent to cure. In studying the influence of climate, Dr. Lawson makes a remark upon a point which has too generally been disregarded, which is that this influence is to be measured not by the sickness and mortality of travellers, troops, and other foreigners, but by those of the natives of any place. He also calls attention to the important fact that the disease is most prevalent in the temperate regions of the globe, but comparatively rare in the Torrid and Frigid Zones. Within the former there is no place free from the ravages of consumption, and often, as at Nice, its endemic mortality ranges very high even in a climate which is considered propitious to strangers who are suffering from the disease. In Asia it appears to be comparatively infrequent, and in Africa even more so. The elaborate tables prepared by the author from the U. S. Census of 1850 show that in the Eastern States the proportion to the population of deaths by phthisis is 1 : 347 ; in the Middle States 1 : 548 ; in the Western north of the Ohio 1 : 911 ; in the Western south of the Ohio, 1 : 1585 ; and in the Southern, 1 : 1898. Hence the mortality from phthisis increases progressively from South to North, and is nearly five times as great in N. England as in the S. W. States.

Another great fact which has been brought out by the climatological investigations of recent years, is that dryness of the atmosphere is the one element which renders a climate inapt to generate tuberculous diseases, and moisture the one which, whether associated with heat or cold, is the agent which chiefly develops and fosters them.

In the section on "Occupation in relation to phthisis," Dr. Lawson refers to the inhalation of irritating particles as a cause of the disease : although he subsequently remarks that in the absence of both the hereditary diathesis and the acquired predisposition, this cause will be far more likely to develop simple inflammation than tubercles. Indeed, he quotes Dr. Holland, of Sheffield, to prove that phthisis is the least frequent among the various pathological conditions which occur in the grinders of that city. As the class of facts here referred to bears upon the question of the influence exerted by inflammation and irritation in producing tubercle, it may not be amiss to refer to some of those which are directly related to it. Dr. Alison states that "there is hardly an instance of a mason employed in hewing stones in the vicinity of Edinburgh, living free from phthisical symptoms to the age of fifty. Nevertheless, tubercles were not found in the lungs of those who were examined after death." Dr. J. C. Hall, whose opportunities for studying the affection in Sheffield itself were peculiarly great, says, "there is no necessary connection between this disease and thoracic consumption. It is possible the two diseases may exist in the same individual, but the connection is purely accidental."[1] And he remarks again, "the disease is in fact chronic bronchitis, followed as a matter of course by dilatation of the tubes, and, at last, inflammatory destruction and excavation of the substance of the lung takes place." A precisely similar and detailed description is furnished by M. Desayvres of the disease which affects the grinders at the manufactory of arms at Chatellerault.[1] Oppert, also, speaking of the analogous disease affecting coal miners, remarks that it occurs without as well as with tuberculosis, and appears to exert rather a favourable influence upon the latter.[2]

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[1] On Thoracic Consumption, p. 49.

Our author quotes Dr. Peacock as stating that the particles inhaled by the workers in French burrstone "are remarkably prone to induce phthisis, and especially so if any constitutional predisposition to the disease exist." But there is nothing in the paper referred to,[3] nor in a subsequent report by the same author,[4] to prove the special influence of the directly irritant cause in producing tubercular disease. This, as well as the confinement, dampness, and fatigue, attendant on their labour, and the dissolute habits in which the workmen indulge, are all causes of a depressing nature abundantly sufficient to develop consumption in those who are predisposed to it, and it does not appear that more cases of this disease occur among them than can be thus accounted for without invoking direct mechanical irritation, which in the majority of cases produced fatal effects without the intervention of tubercular disease.

In the chapter upon *Ingesta in relation to phthisis*, Dr. Lawson makes the following statement:—

> "It has been estimated that the inhabitants of Paris consume six times as much animal food as those of London, and yet consumption is more common in the former than the latter city."

We can not but ask ourselves whether the order of naming the two cities has not been inverted. The English are as proverbially beef-eating as the French are bread-eating; and the ordinary statements of mortality from phthisis show Paris and London to be in this respect upon an almost equally bad eminence. (Casper.)

In examining the influence of alcoholic drinks upon phthisis, Dr. Lawson makes the just remark which intemperate apostles of temperance would do well to heed, that the effects of the use and the abuse of these drinks are constantly confounded. He shows that several independent observers have found in post-mortem examinations of intemperate persons a much smaller proportion of tuberculous deposits in their lungs than in those of other persons. He remarks, further, that it is not easy to separate the influence on the health of intemperance and its attendant evils, the exposure, fatigue, bad and insufficient food, &c., and that if alcoholic drinks do really contribute *per se* to the induction of phthisis, we ought to find among its votaries who have been ruined by it in health and estate an excessive proportion of deaths by consumption. But this result, says Dr. L., has not been observed; on the contrary, we may add, the conviction is strong that the very opposite result has been produced. It has not been remarked, so far as we know, that the temperament and constitution which lead to the abuse of alcoholic drinks are antagonistic, as it were, to those which belong to the phthisical diathesis. The sanguine are fond of excitement and of the associations which lead to convivial excesses; but the nervo-lymphatic, of small appetite and feeble digestion, and who court quiet and loneliness rather than scenes of boisterous mirth, are the predestined victims of consumption. If these persons fall into habits of intoxication, they rapidly become dyspeptic, wasted, and feeble, and tuberculosis soon follows. Those of the other class, on the contrary, are more liable, as Dr. L. remarks, to fall victims sooner or later to diseases of the digestive organs, the kidneys, or the brain. Dr. N. S. Davis, of Chicago,[1] has endeavoured to throw light upon this inquiry by ascertaining the previous habits in regard to alcoholic drinks in 210 cases of consumption. But evidently they are not pertinent to the matter. As stated, they were all cases of phthisis. Now the question is not how many out of a certain number of consumptives indulge in alcohol, but how many out of a certain number of alcohol drinkers become phthisical, and whether that number represents a greater or a less proportion than become so among persons who eschew alcohol in every shape? A definite answer would, we suspect, be impossible, but the elements for making an approximative one are stated above.

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[1] Archives gén., 5ème sér., iii. 718.

[2] Prager Vierteljahrs., lxi., Anal. 26.

[3] Br. and For. Med.-Chir. Rev., Jan. 1860.

[4] Med. Times and Gaz., Oct. 1860, p. 418.

The relation of *inflammatory affections* of the lungs to tubercular consumption is a very interesting one. It was very natural, before the true nature of the disease was understood, and afterwards even until the means of detecting its earliest traces were discovered, that diseases which had so much in common as chronic bronchitis, chronic pneumonia, and chronic phthisis on the one hand, and on the other the acute forms of these diseases should be mistaken for one another. Every one acquainted with physical diagnosis is called upon, even now, to witness similar blunders of incompetent physicians, to see phthisis mistaken for bronchitis, and to learn how readily the error may be committed of attributing the former to an original attack of the latter. Morton, with his characteristic sagacity, avoided it; yet he did not fail to recognize the fact that *acute* phthisis is sometimes lighted up by pulmonary inflammation. His words are these:—

> "It is easy to observe that a dry cough and a very acute consumption do often come from an inflammation of the lungs, a pleurisy, or some other disease of the lungs. . . . In those places where the inflammation has before for some time prevailed, there are hard tubercles to be found, dispersed up and down, together with a dry cough and a continual hectic fever; from whence such patients being once seized with a very acute consumption, die within a few weeks."[2]

And that other greatest among the masters in this domain, Laennec, makes use of the following exquisite illustration:—

> "And thus, to avail myself of a metaphor which is, perhaps, not so foreign to the present subject as at first sight it may appear, on land which is worked after having long lain fallow—or been left to itself after several years of culture—we may observe that a multitude of seeds germinate, which for years had been concealed in its bosom."[3]

Morton would appear to have thought inflammation the efficient, but Laennec only the occasional or exciting cause of tubercles. Laennec regarded even this coincidence as rare, declaring that in nineteen-twentieths of the cases in which the two conditions existed, the inflammation was excited by the presence of the tubercles. Louis dwells particularly on the different seats occupied by inflammation and by tubercle in the lung—the former occupying the lower, but the latter the upper portions of the organ. Grisolle enters more fully into detail, particularly as regards pneumonia, and proves that phthisis rarely follows immediately upon pneumonia; that even then there is more reason to believe the latter an effect of tubercles than a cause of them; and that in infinitely rare cases where miliary tubercles have appeared to be developed in a hepatized lung, the pneumonia has acted as an exciting and not as the efficient cause. Dr. Copland states that frequent attacks of inflammation of the lungs may develop phthisis in scrofulous and lymphatic persons, but that it is not necessarily a consequence of these affections. Lebert declares that they rarely have such an influence, and adds, "I am unable to comprehend how so unfounded an assertion came to be received as a general dogma, were it not that the most of our observers are too much afraid to open their lips to gainsay any of the numerous popes who fabricate articles of faith for our medical creed."[1] M. de Mussy is among those who regard the acute inflammatory affection as something more than an agency which, acting on the system at large, merely arouses the latent tuberculous diathesis into action. He says, "Under the influence of the diathesis this morbid irritation of the lung, instead of terminating in resolution, ends in the production of a heteromorphous deposit, the tubercle." It is sufficient to reply, as has been done ever since the days of Bayle, that bronchitis affects the lower lobes of the lungs, but tubercles are deposited at their summits. With the decisive opinions of the great masters in pathology against the doctrine in question, and our own observations in full accordance with theirs, we cannot subscribe to the conclusion which Dr. Lawson draws from his experience: "That a large number of cases of phthisis have their starting-point in an inflammatory affection involving some of the pulmonary structures." (p. 276.) His own illustrations do not, we think, sustain him in this position; and, we may add, his own expressions in other places. Thus, when speaking of the alleged inflammatory origin of tubercles, he says:—

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[1] Trans. Am. Med. Assoc., xiii. 565.

[2] Op. cit., p. 91; vide, also, p. 121.

[3] Op. cit., ii. 71.

> "All of the phenomena of the disease pointedly contradict this hypothesis." (p. 145.) And, again: "While we admit, therefore, the occasional occurrence of tubercles as a sequence of pneumonia, independent of a diathetic state, it must be stated that such a result is most usually met with in those having some hereditary predisposition to tuberculosis." (p. 278.)

To this, no objection can possibly be made. It must be admitted that certain forms of disease tend to develop tubercles in the lungs, but they are not exclusively, nor even principally such as spend their force upon these organs.[2]

The influence of *malaria* upon phthisis has been much discussed of late years, and a belief in its beneficial or antagonistic qualities been very strongly expressed by Dr. Walshe. After a candid discussion of the principal data of the question, Dr. Lawson arrives at an affirmative conclusion, and states his belief "in some degree of antagonism between marsh miasmata and tuberculosis." It would seem, on the whole, however, that the remedy, if it be one, is worse than the disease; for death by phthisis would be far preferable to dragging out a life rendered wretched and intolerable by the cachexia of marsh malaria. In analyzing the materials made use of by writers upon this topic, we have been struck with the frequent references made to malarious localities, in which it is said phthisis is of rare occurrence, without, however, any reference to their being situated in warm regions, where, under a general law, phthisis must be comparatively infrequent. All such instances, it is evident, have no bearing upon the question. Nor is it sufficiently clear that one reason of the apparent immunity from phthisis of the inhabitants of certain places is not the death by malarious diseases of the greater number of those who, from constitutional debility, would have been the fated victims of consumption. Dr. Lawson does not refer to a valuable paper upon this subject, by Dr. Peacock,[1] who sums up the matter in these words :—

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[1] Handbuch, ii. 139.

[2] The essential independence of tuberculosis and inflammation is demonstrated in an able paper by SAMUEL LEWIS, M. D., in the Philad. Med. Exam., March, 1854, p. 145.

> "The correct inference would appear to be that the influence, if any, exerted on the prevalence of consumption, by a malarious atmosphere or by ague, is far less important than that of various other causes which affect the development of that disease. The practical conclusion also to be arrived at is, that as phthisical patients may take ague, and as such complication materially aggravates the original disease, we should, in selecting residences for consumptive patients, avoid those situations which are marshy, or in which aguish affections are known to prevail."

The *contagion* of phthisis is a subject not alluded to by Dr. Lawson. Dr. Copland reminds us that the disease is stated by Aristotle to be contagious, and that Baillou mentions its being communicated by patients to their nurses; he also adds that emanations from persons in the second and third stages of the disease "are certainly sometimes productive of consumption," and he rebukes the scepticism of those who think themselves "strong-minded" because of their incredulity. Morton declares that, like a contagious fever, it does infect those that lie with the sick person. Laennec reminds us that Morgagni was so persuaded of its contagiousness, that he dreaded to examine the bodies of those who died of it; and, after relating how in other countries it is popularly believed to be contagious, and that the bedding and clothing of the deceased are destroyed by fire in order to prevent this evil, he adds, with a touch of banter, that "in France, at least, it appears not to possess contagious qualities." He then relates how, twenty years before, he accidentally inoculated himself on the hand, while dissecting a tuberculous bone, and in the course of a week a little tumour formed, which, on being cauterized, discharged a mass which closely resembled yellow crude tubercle. We recall this anecdote for the purpose of appending to it M. de Mussy's commentary :—

> "Laennec," he says, "was inoculated with tubercle, as were Alibert and Biett with cancer. Because there were no local effects, all three concluded that these diseases are not transmissible by inoculation; yet Laennec died of consumption, and Alibert and Biett of cancer."

This writer also adduces two cases of men of robust constitution and amply developed chest, who became tuberculous after cohabiting with consumptive females, and two others in which the disease appeared to be communicated, under similar circumstances, to males. Dr. M. Cormac denies that consumption is any more contagious than a fractured limb. Yet he saw mothers seized with phthisis after nursing consumptive sons and daughters, sisters after having waited on sisters, brothers after succouring brothers. We shall never forget a case of the sort which we once met with. A widow, fifty-five years of age, thin, active, hardy, the very type of toughness in constitution, had many years before lost her husband with phthisis, and was about to lose a daughter of seventeen with the same disease. A few hours before the girl died her head lay in such a position upon her mother's shoulder that the latter could not avoid inhaling her daughter's breath.

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[1] Br. and For. Med.-Chir. Rev., Jan. 1859, p. 202.

She described it as causing an acrid sensation in her throat and a taste which she was unable to get rid of. In about a fortnight she began to cough, soon afterwards had hæmoptysis, and within six months died of advanced consumption of the lungs. This may have been a coincidence, and so may the death by phthisis of the first two resident physicians of the Brompton Hospital for consumption, and the seven cases referred to in this connection by Dr. Leared.[1] It may be that all such instances are explicable upon the ground that the individuals attacked would have been so at any rate; for, certainly, the liability of most persons to this malady is greater than it is to any other cause of death. Nevertheless, the individual cases above referred to, and others which the experience of any physician who frequently treats the disease in private practice will furnish, are sufficient to justify Dr. Copland's rebuke, and to inculcate the duty of our preventing all unnecessarily close contact of the healthy with those who are in the advanced stages of consumption.

The subject of the influence of *pregnancy* upon phthisis is naturally one which interests every physician in his professional or personal relations. It is well known to be a commonly received opinion, that pregnancy suspends the progress of phthisis, an opinion which has been strongly controverted of late years, but quite as zealously defended. But in the defence the ground of the discussion is sometimes more adroitly than fairly shifted, by arguments referring to the phthisical constitution rather than to phthisis itself. Thus, Montgomery[2] says: "My own experience would lead me to the conclusion that if a woman predisposed to phthisis, but in whom the disease has not actually become developed, prove pregnant, she is likely to be benefited thereby; and I think I have seen life thus prolonged for years, in several instances." So, Dr. E. Warren[3] declares: "My object has been to show that pregnancy *prevents the development* of tubercles in *those predisposed to phthisis;*" and Dr. Lawson remarks: "It is my conviction that in the tubercular predisposition, or even the *precursory* stage of phthisis, the occurrence of pregnancy under favourable circumstances, and frequently repeated, so changes the vital actions as to delay, or entirely arrest the impending local deposits." On the other hand, Dr. Montgomery remarks, "If pregnancy takes place in a woman already actually in consumption, or if this disease supervene on pregnancy, the fatal issue is as likely to be accelerated as postponed, or, perhaps, even more so." Dr. Warren, after announcing his proposition as above, says that the objectors "have laboured to prove that pregnancy does not ARREST phthisis itself, *when actually established*"—a statement, therefore, which he does not formally contradict; and Dr. Lawson, in regard to "this influence exercised by pregnancy over the *progress* of tubercles after they are deposited," expresses the opinion that if the tubercles are recent, few, and crude, and the strength and digestion of the patient good, the puerperal state [? pregnancy] may retard the progress of the local disease; but on the other hand, if the deposits are extensive and softened, the influence of gestation will almost inevitably prove injurious.

Now, the first proposition, defended by the writers just quoted, will appear, upon a moment's consideration, to have little or no bearing upon the question to be decided. Their assertions and their arguments amount to this, merely, that a *predisposition* to phthisis is not converted by pregnancy into consumption. But in what does a predisposition to phthisis consist? Is there a single infallible sign of the mere imminence of the disease? Do we not constantly meet with persons who appear to possess all the physical characteristics of the phthisical constitution, and who, yet, for many years, or altogether, escape the disease? If females of this description bear children without suffering from tubercles, it merely proves their diathesis to be less decided than it seemed. The second proposition, in fact, yields the whole question. All of the writers referred to admit, or do not venture to deny, that actual tuberculosis of the lungs is not retarded or favourably modified by pregnancy. Dr. Lawson does, indeed, say that if the tubercular deposit is limited and quiescent, and the general symptoms slight, pregnancy may retard the progress of consumption. But it is plain that those very conditions insure a slow progress of the disease independently of pregnancy.

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[1] Med. Times and Gaz., Oct. 1856, p. 362.

[2] Signs and Symptoms of Pregnancy, 2d ed., p. 46.

[3] Prize Essay, p. 38.

The well-known contributions of Grisolle and Dubreuilh to a positive basis of knowledge upon this subject, are opposed to the general conclusions of our author. The former of these gentlemen has recorded thirty-five, and the latter thirteen cases suitable for the solution of the question in hand. Now, if the evidence furnished by these cases were indefinite or ambiguous, they might be set aside; but so far from being of this character, they all, without a single exception, agree in proving that pregnancy does not suspend the progress of consumption.[1] Even more, they show that it does not modify materially the principal symptoms of the disease. It also appears, from the cases above referred to, that, while occasionally phthisis may suddenly declare itself, or else rapidly grow worse, after delivery, as it does during the convalescence from various acute diseases, yet in by far the greater number the disease pursues its regular course, and in half of those who were delivered during the first or at the beginning of the second stage of the disease, the symptoms underwent a decided improvement. Dr. Lawson remarks on these conclusions of Grisolle that it is "utterly inconceivable" that pregnancy should hasten, but parturition restrain or arrest the progress of phthisis. We beg leave to remark, however, that the statement of Grisolle is not one of opinion, but of fact, and that if *le vrai n'est pas toujours le vraisemblable*, so *le vraisemblable n'est pas toujours le vrai.*

A somewhat distinctive feature in Dr. Lawson's treatise consists in his ascribing to phthisis, and therefore in his introducing into its history certain preliminary and, as we may say, premonitory indications of a tendency to it, and, also, of its approach. The former he styles the tuberculous *constitution*, objecting to the term *diathesis*, as being used to designate not a morbid condition, but a mere tendency to disease. We greatly err if the definitions are exact. The former term, constitution, is never applied to a morbid condition, while diathesis invariably includes the idea of such a state, actual or potential. Now this "constitution" is manifested, we are told, in tangible modifications of structure or function which indicate a departure from the physiological type. As the author passes them in review, however, they mock the mental apprehension like dissolving pictures. We are assured, in as many words, "that there are no certain and infallible external indications of the tuberculous constitution." The tubercular dyspepsia of Philip, and Todd, and Bennett is proved to be a phantom evoked for theoretical uses. It might have been added that the acid dyspepsia which plays so important a part in the last named gentleman's hypothesis, and which has some acceptance in Scotland and Germany, seems to be a natural consequence of oaten food in the one case, and of that "greasy and sour" cookery in the other, which has been so deservedly vituperated by travellers.

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[1] Bull. de l'Acad. de Méd., xvii. 14.

The impaired power of expansion of the chest and lungs, which has been naïvely suggested to explain the deposit of tubercle, evidently depends upon loss of power in the respiratory muscles; and when it shall have been shown that emaciation can advance so far as to occasion this debility without tubercles having been deposited in the lungs, the hypothesis will become more worthy of serious discussion. The attenuated state of the bloodvessels is said to favour the exudation of tubercle; but again it must be asked which of the two precedes the other? The nervous system in the tuberculous constitution, we are told, possesses an average degree of tonicity below the healthy standard. Here it seems probable that the strumous diathesis in the light-haired races has alone been kept in view; for assuredly in the dark and in the negro races no such peculiarity exists. We cannot, therefore, even upon the author's own exposition of the subject, agree that these and one or two minor "vices of the constitution may be safely regarded as an accurate measure of the predisposition" to consumption. We are, indeed, at a loss to comprehend how he can regard them, even when united, as anything more than indications of a slightly greater probability that consumption may supervene than that it will not do so. The same may be said, moreover, of all kinds and degrees of impaired vigour, except such as depend upon diseases specifically antagonistic to phthisis.

The phenomena indicative of the approach of phthisis are included by Dr. Lawson under the head, "*The Precursory Stage of Phthisis, or Tuberculoid Condition.*" It is said to be "characterized by decided morbid action, and yet is anterior to the deposit of tubercles." (p. 28.) Elsewhere it is distinguished from the diathesis (which term, as we have seen, the author uses to denote a mere predisposition, which may never become developed into disease), as being "the beginning of a positive morbid action, which, if not arrested, surely and steadily progresses to the deposit of tubercles." (p. 315.) In this stage, it is said, "we observe a more marked departure from the physiological state than belongs to the mere constitutional predisposition; thus, the system loses weight, the strength diminishes, the secretions become still more variable, and calorification and innervation sink below the natural standard." These various phenomena our author illustrates in detail; but, after carefully examining what he has written, and finding that in a large number of cases "they pass unnoticed;" that "dyspepsia is not generally present;" and "that irregular chills with slight febricula" are asserted, without any proof whatever, to occur before any deposits in the lungs exist; we remain very sceptical concerning their reality as antecedents of tuberculization. Undoubtedly, if tubercular deposits in the lungs depend upon constitutional causes, they may be preceded by special cachectic symptoms, and it rests with observation to declare what is the character of those phenomena. Now, neither Morton, Laennec, Louis, Stokes, Walshe, nor any one recognized as authority in such matters, whether among English, Continental, or American physicians, ever discerned such a state, still less attempted to describe it.[1] Its first appearance in English, we believe, was in the Prize Essay of Dr. Howard Payne Cotton, which, like too many other essays of the same class, suggests that the competition for the prize must have been very limited, indeed. This author opens a chapter with the startling announcement that "prior to the appearance of tubercle, phthisis is very frequently within the control of remedial measures"[1] (p. 26), and afterwards describes the symptoms preceding the formation of tubercles, as progressive loss of vigour, pallid or sallow complexion, anxious but animated expression, sharpened features, hurried movements, irritable and capricious disposition; uncertain appetite, imperfect digestion, passive diarrhœa; slow, small, and excitable pulse; restless and unrefreshing sleep, with occasional perspirations; and invariable loss of weight. Dr. J. C. Hall treats of a "period preceding the deposit of tubercle," in terms evidently borrowed from Dr. Cotton. Dr. Edward Smith has his notion also of a "pre-tubercular stage which is capable of easy demonstration," but ignores this long list of portentous symptoms, and especially those of a dyspeptic nature, and makes it to consist in a "diminished vital capacity of the lungs," which appears to mean a diminished power of expansion, and is attributed to exhausting causes of some kind not specified.[2] A very rational account of this subject is contained in the Lectures of Dr. James E. Pollock,[3] who states that the earliest symptom of tubercular disease is wasting, which precedes cough, hæmoptysis, and all the physical signs, and is earlier in point of time than hectic. After wasting, debility soon supervenes, and then some hectic fever, and occasionally purpura and mucous hemorrhages. The most extraordinary pre-tubercular stage is that described by Dr. John Hogg.[4] The array of symptoms ascribed to it above is one of mere trifles compared with that which he depicts. Our space forbids even a complete summary of them; but, besides a leaden, greenish, transparent, or pimply skin, a countenance that "acquires an air of mild benevolence," a red furred tongue, thirst, fetid breath, confined or loose bowels, emaciation, with thin, skinny, cold, blue, lumpy, and bulbous fingers, we have emaciation rendering the joints prominent, the once capacious chest becoming flat, the breasts in females shrinking away, and the clavicles projecting; "the faculties of the mind falter, and are incapable of any exertion;" a presentiment of evil is experienced, and an occasional hectic flush is observed on the cheek. Our experienced readers will imagine that we have here a picture of consumption far advanced, but they are mistaken. Dr. Hogg says, "The lungs even now probably present obstacles, *by their atrophy and shrinking,* to the free circulation of the blood through them, causing an increased effort of the heart to propel it, *the tuberculous deposit not having yet commenced.*" (p. 31.) According to this author, the debility still goes on increasing, and is attended with headache, stitch in the side, shortness of breath and a short, hacking cough, and, in females, with leucorrhœa and amenorrhœa. There is now dulness under the clavicles, generally the left, and the respiratory sounds at the same points are rough. But "up to this time there has been no deposit of tubercle, so far as we can discover" (p. 37); while "in more

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[1] We should, perhaps, except M. Fournet, whose principal work (*Recherches cliniques*, &c., *et sur la première Periode de la Phthisie pulmonaire*, Paris, 1839) contains many of the details now given by Dr. Lawson respecting this mythical stage of phthisis. Its conclusions have generally been regarded as not proven. See a

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criticism in the Brit. and For. Med. Rev., ix. 323. In a paper on "The Curable Stage of Phthisis" (Edinb. Med. Jour., ii. p. 683), Dr. Edward Smith claims that such a stage exists, and denominates it the "pretubercular stage," but offers no tangible proof of its reality.

[1] The Nature, &c., of Consumption, London, 1852.

[2] Lancet, Nov. 1856, p. 489, 524.

[3] Lancet, Aug. 1856, p. 154.

[4] Practical Observations on the Prevention of Consumption, London, 1860.

marked cases, where tuberculization is nearer at hand, the inspiration is puerile, bronchial, or even amphoric, according to *the intensity of the predisposition* to the disease, while expiration is short and *indistinct*." With these signs, that is, all that have been described, some authors, says Dr. H., "Laennec, Louis, and others consider tuberculization to have commenced." We should think they did. But, we are told, "Louis goes so far as to say that 'tuberculization commences from six months to two years before its announcement by cough or any obvious pectoral symptoms.'" We are not able to find any such statement made by Louis; on the contrary, he declares that "in the majority of cases coughing begins without any assignable cause, in the midst of perfect health." (*Op. cit.*, p. 526.)

Is Dr. Lawson prepared to accept these descriptions as representing the precursory signs of phthisis, and if so, which of them? They are mutually contradictory, and comprise all grades of disease from the nearly absolute negation of symptoms by Dr. E. Smith, up to the numerous and grave disasters described by Dr. Hogg, and which really appertain not merely to the stage of crude tubercles, but to that of softening also. Under the title "First Stage," Dr. Copland enumerates the greater part of the less grave symptoms which have been above referred to; but he says: "The lungs at this period contain a greater or less amount of tubercular deposit in what has been called a state of crudity" (p. 14). This is the opinion universally held by all who are conversant with the subject, except the writers above named and a few others of inferior position, and it is also that which we entertain ourselves; but as we know of no greater pleasure than an increase in knowledge of the laws of disease and of the means of curing it, we should hail with heartfelt satisfaction any novel view or method, provided only it were based on truth. Thus far we think that the statements in question have been shown to be inconsistent with truth; and, therefore, when we find Dr. L. adding to the characters already enumerated, signs revealed by inspection, percussion, and auscultation, yet perfectly equal upon the two sides of the chest, signs, therefore, which can depend only upon the debility of the patient, and possibly on a partial but symmetrical loss of flesh, we feel persuaded that he has allowed himself to be led astray from the real towards the ideal by a desire to over-refine in the art of diagnosis which he has so successfully cultivated.

In the critical remarks that have been made, it is not our intention to imply that no phenomena exist which may justly be suspected of indicating the imminence of consumption. In this disease, as in most others, the local lesion is the result of a previous derangement of the nutritive functions; but we look in vain for proof of the special character of that derangement. Before the deposit of tubercle reveals itself by physical signs, the health must be deranged, for these signs are indicative only of a certain accumulation of the morbid matter; and it must not be forgotten that the tubercular deposit, in some cases in which its recognition is preceded by general symptoms of impaired health, may not occupy the apex of the lung, but a more central part of the organ where its existence is not betrayed by any physical signs. Yet in not a few cases the evidence of impaired health is either wanting altogether or is quite equivocal, as the preceding statements are intended to show. We are disposed to believe that the symptoms which precede the material evidence of tuberculization are very far from uniform, and depend for their special character upon the age, sex, constitution, temperament, and various other peculiarities of the individual patient, among which the habitual want of vigour of some particular function holds a prominent place. The person of weak digestion may suffer from dyspepsia, and the nervous, from an increased excitability, including chilliness and feverishness; some may experience shortness of breath, and others neuralgic pains in the chest, but the only condition common to the greatest number on the approach of chronic phthisis is loss of flesh and strength. The semeiological value of this symptom, it need scarcely be added, depends altogether upon the absence of every other cause, and they are legion, which can produce the same effect. Besides which, as Dr. Lawson remarks in another place, there are frequent exceptions to the rule, and Louis found only one-half of the cases exhibiting emaciation from the beginning. A similar fact has been observed by Fournet, Walshe, and others. For ourselves we should regard dry cough as far more frequently than emaciation, the earliest symptom of consumption.

We have not, in the preceding review, taken any notice of a paper by M. H. Bourdon, and which was really in advance of all that have been cited,[1] because this writer does not claim that the symptoms which he describes are independent of tuberculization, although they may precede the physical signs of that condition. The paper of Dr. B. is of sufficient importance for us to transcribe its conclusions, which are as follows:—

> "When disorders of the digestive function are observed, and particularly chronic dyspepsia, or vomiting without evident cause and which is intractable to all treatment;
>
> "Or when, although there is neither hepatitis nor heart disease the liver is enlarged and tender;
>
> "When these phenomena occur alone or during such a disease as chlorosis, typhoid fever, or measles, phthisis is to be suspected.
>
> "Therefore the medical history of the patient must be learned, and his respiratory apparatus must be closely scrutinized for any trace of commencing tuberculization that may exist; and if, notwithstanding the absence of every characteristic stethoscopic sign, there should be a daily exacerbation of fever and perspiration at night, emaciation, and debility, the presumption in favour of phthisis would be very great indeed, and prudence would require that its existence should be regarded as certain."

Among the symptoms of the precursory stage of phthisis *enlargement of the mucous follicles of the pharynx* occupies a prominent place in Dr. Lawson's description. We supposed that this condition of the throat had ceased to be spoken of as an essential phenomenon or even a frequent complication of phthisis, except by writers who address themselves to the fears of invalids rather than to physicians made familiar with disease by personal observation and an enlightened literary culture. The prominence accorded to it, therefore, by a writer so well fortified by experience and study as Dr. L., induced us to revise our judgment and endeavour to rectify in it whatever the review might prove to be erroneous. Dr. Lawson admits that "systematic writers have dwelt but little on the condition of the pharynx in the early stage of tuberculosis," but adds, "in the more advanced stages of tubercular disease the affection of the throat has been *fully described by nearly all writers.*" (p. 319.) These remarks imply that the condition of the pharynx has not usually been studied, but that where it has been examined the lesion in question was detected. Upon this inexplicable statement we need only remark, after Louis, that in one hundred and twenty cases of death by phthisis, ulcers of the pharynx were found *only four times;* that they were numerous, small, and equally disseminated over the whole membrane; and that during life they occasioned no symptoms whatever.[1] This last clause meets the objection that attention had not perhaps been paid to the symptoms which the state of the throat would occasion.

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[1] Actes de la Soc. Méd. des Hôpitaux de Paris, 1852.

If it is suggested that in these cases follicular disease and its local consequences may have disappeared before death, we reply by quoting Dr. Lawson, who says, "I am fully satisfied that, in a large majority of cases passing into consumption, the pharyngo-laryngeal structures become *early and permanently* diseased." "The form of morbid action," says Dr. L., "to which the tonsils are subject, appears to be of a suppurative character, and, as believed by Dr. Green, also tubercular." These glands are said to be early enlarged, but this condition is not permanent; "on the contrary, the tendency is to a suppurative or even ulcerative action, with, ultimately, absorption or destruction of almost the entire glands." If Dr. Lawson makes this statement upon his own authority we must be content to believe that his experience has been altogether peculiar, for there is not a single pathological anatomist who describes anything of the kind as characterizing the tubercular diathesis or disease. On the contrary, no fact is more familiar than that in persons of a strumous constitution enlargement of the tonsils tends to become permanent with *induration.*

Equally singular is the opinion of Dr. Lawson, that the cheese-like substance observed in the tonsils, and which occasionally becomes cretified, is of a tuberculous character. Yet he quotes Höfle, Wedl, and even Rokitansky in support of the opinion. But Höfle and Wedl say of these yellowish-white, oval, and fetid masses that "they are hawked up by both healthy and diseased individuals," and "have heretofore been frequently regarded as crude tubercles." Wedl adds that upon microscopic examination they are found to consist merely of buccal epithelium, pus-corpuscles, oil-drops, and solid amorphous fat.[2] Foerster speaks of them as dried mucus and pus which sometimes undergo calcification;[3] and Lebert describes their cheesy consistence and fetid smell, and their conversion into bodies of almost stony hardness "which, when rejected, are easily *mistaken* for tubercles."[4] But Dr. Lawson asserts: "Rokitansky calls the substance 'tubercular or cheesy plugs,' and there is reason to believe that it is of a tuberculous character." This statement we are obliged to rectify: The words of the Viennese anatomist are these: "The *purulent secretion* not unfrequently becomes inspissated, so as to form tubercular cheesy plugs, or even chalky concretions," the word tubercular evidently referring to the form and not to the nature of these bodies.[5] Neither in the first nor in the last edition of his treatise does he so much as mention the pharynx among the organs in which tubercles may be deposited, and in the second work his only allusion to the pharynx, in this connection, is when he says, "scarcely ever does tuberculosis spread from the larynx into the pharynx."[6]

As already stated, Dr. Lawson avers that in "*a large majority* of cases passing into consumption, the pharyngo-laryngeal structures become early and permanently diseased" (p. 319); but subsequently his opinion is expressed in very different terms; for he says (p. 321), the *constancy* with which the throat affection is manifested shows its intimate relation to tuberculosis "at least in *a certain number* of cases." In the next sentence he speaks of its occurring as one of the earliest signs in "*a large class* of examples." These varying terms present an idea of the frequency of its occurrence which is very far from precise. Further, the degree of its evil influence does not seem to be very definitely settled in the author's mind; for, while he "will not go so far as to maintain it to be a cause of the local deposits" in the lungs, still he thinks it "by no means certain that this condition is not a primary local lesion, incident to the tuberculous state," which "at least hastens the pulmonary affection." But if it is not an ordinary antecedent of phthisis, or if phthisis is not its ordinary sequence, this statement loses all weight and force. That there is no such relation between the two affections we have already given authoritative reasons for believing; but more remain behind in the statements of the most experienced observers of disease and the most accomplished pathological anatomists.

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[1] Op. cit., pp. 67, 68.

[2] Syd. Soc. ed., p. 325.

[3] Pathol. Anatomie, pp. 8 and 12.

[4] Handbuch d. prakt. Med., ii. 215.

[5] Syd. Soc. ed., ii. 7.

[6] Vol. i. p. 308.

In 1853 the late Dr. Todd fully described the symptoms of the throat disease and its treatment, and even admitted, what is denied by others, that it "often extends to the larynx and trachea, and sometimes into one or more of the bronchial tubes." He does not say one word of its relations to phthisis either as cause or effect, but alleges, on the other hand, that it "is very common in men of gouty diathesis, and in women of a relaxed habit who do not take proper care of their health."[1] Now, gout, it is well known, is antagonistic to tubercle.

Lebert, after describing the affection as "angina gutturalis" and "angina chronica," remarks that it "sometimes gets well spontaneously, sometimes lasts for months or years, and either gradually disappears, or, without occasioning any danger, may never be completely cured. Not unfrequently it is associated with chronic diseases of the skin."[2] Grisolle remarks: "This disease is not only rebellious, but may induce various annoyances; thus it may ultimately produce a complete change in the voice; but it never is fatal, and Dr. Green to the contrary notwithstanding, it can never undergo any organic degeneration."[3] Dr. Flint, whose authority as a pathologist is only surpassed by his character for probity, says: "Having had opportunities of observing numerous cases in which chronic pharyngitis has persisted for years, I am satisfied that so far from the affection tending to tuberculosis, it is rather rare for the latter disease to become developed in this class of patients; and, in fact, I have been led by experience to regard the former as militating against the presumption of the existence of the latter."[4] M. De Mussy, who mildly expresses his astonishment at some of the horrible results attributed by certain writers to follicular disease of the pharynx, asserts, nevertheless, that it frequently complicates phthisis. But he has so little notion of its being a stage or a cause of tubercular consumption, that in his article upon its pathogenesis the word tubercle does not even occur, and the affection itself is regarded as a manifestation of the herpetic diathesis.[5] One of the Brompton Hospital physicians, Dr. Edward Smith, has written an article entitled "Remarks on the Throat, in Cases of Chronic Phthisis and Chronic Bronchitis," which shows that he made the disease a subject for special investigation; yet he concludes that enlargement of the pharyngeal follicles is much more common in chronic bronchitis than in phthisis, while the condition most characteristic of the latter disease is *paleness* of the mucous membrane of the throat.[6]

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[1] Times and Gaz., Feb. 1853, p. 209.

[2] Handbuch der prakt. Med., ii. 210.

[3] Pathol. Interne, 7ème éd. i. 258.

[4] Diseases of the Respiratory Organs, p. 497.

[5] Traité de l'Angine Glanduleuse, p. 95.

[6] Liverpool Med.-Chir. Jour. July, 1857, p. 189.

Anxious as we are to avoid even the appearance of injustice, we subjoin the testimony of another Brompton physician, Dr. Alison, of whose work we have spoken in terms of praise. After referring to certain tracheal and laryngeal sounds indicative of the *first stage* of consumption, he remarks: "When, on the other hand, the fauces have been long congested, when there is ulceration, or when there are signs of recent inflammation, when the urgent symptoms of laryngitis and croup are pressing, it is *littlé* likely that phthisis is present." (p. 116.) In another place he says: "The pharynx in the first stage of phthisis *occasionally* becomes the seat of physical alteration. The mucous membrane is roughened as well as reddened. The follicles become enlarged, and sometimes, but rarely, the seat of minute ulceration." (p. 122.) In the second stage an analogous condition is stated to exist in "a large proportion of examples," (p. 164,) and in the third stage also "in an aggravated form." (p. 267.) But, in a subsequent chapter, this author says:—

> "If, when the patient is only slightly disturbed in his health, and when the thoracic physical signs of phthisis are ill marked, the gums present a fine red border along the edge of union with the teeth, and the fauces are only very slightly congested, or *perfectly healthy*, the probability of pulmonary disease in an incipient form being the primary complaint is considerable. If, on the other hand, the fauces be highly vascular, granular, or granulous, the posterior wall of the pharynx be rough, tuberculated, and covered here and there with thick green mucus, or the tonsils be irritable, large, and projecting, and associated with enlarged cervical glands on the exterior of the neck, and the voice be more or less hoarse or nasal, and *no decisive physical signs* of phthisis are to be obtained by auscultation or percussion, it is highly probable that the primary and chief disease is within sight, and that the thoracic symptoms and signs are only secondary, and *very likely to pass off* upon the cure of the morbid conditions above referred to." (p. 354.)

We have been particular to quote these passages, because, like those of Dr. Lawson, they are more or less at variance with the statements of other authoritative writers on phthisis, and more especially because they are in direct opposition to those of Dr. E. Smith, who studied the disease in the very same institution as Dr. Alison, so that the discrepancies are not explicable by any presumed difference of climate, race, &c. But the statements of Dr. A. are so far from being harmonious in support of the idea that granular pharyngitis has any direct relation to phthisis, that he actually adduces the existence of this condition as denoting freedom from pulmonary tuberculosis, and antithetically with the declaration that a perfectly healthy throat, in connection with a red line on the gums, renders the probability of pulmonary disease considerable.

We have said enough, and perhaps more than enough, to show that the frequency, nature, phenomena, and tendency of follicular pharyngitis have been misapprehended by the author of the work now specially under notice, and above all that it has no connection whatever, except an accidental one, with tubercular consumption. Our own observation accords perfectly with that of the gentlemen whose testimony has been quoted. For twenty-five years that we have studied diseases of the respiratory apparatus with peculiar care in public and in private practice, both before and since the attempt was first made in this country to excite attention within the profession and alarm beyond it by styling an innocent but annoying throat affection "tubercular," we have never yet witnessed any relation between tubercular phthisis and the follicular disease in question other than one of mere coincidence in exceptional cases. In the former we have sometimes found the throat anemic, wasted, and occasionally dry, but very rarely studded with enlarged follicles; in the latter the chest symptoms of any sort have been usually slight, and we can scarcely recall an instance in which it preceded the development of consumption.

We have no wish to conceal the fact that sundry writers assert the more or less intimate relations of follicular pharyngitis and phthisis. They are, in part, however, such as seem to address more frequently a popular than a professional audience in the little books which they usually publish. Others appear to have compiled indifferently from sources of very unequal authenticity and authority, and to have filled their pages with contradictions to which their own inexperience blinded them. We are acquainted with no other example than that of the work before us of so much ability and so many proofs of candour in the treatment of the subject generally, associated with what we are bound to pronounce an incorrect description and an unfounded and dangerous doctrine.

Dr. Lawson, in treating of *hemorrhage* as a symptom in phthisis, does not allude to the possibility of its occurring as a result of heart disease, or from a suppression of the catamenial, hæmorrhoidal, or some other habitual discharge. He states, also, his opinion "that copious hemorrhage may occur anterior to the deposit of tubercles," (p. 325,) assigning, however, the untenable reason that no physical signs of tuberculous deposit may precede the discharge. In another place, he says, "I am fully persuaded that pulmonary hemorrhage, in a vast majority of cases, is the result of tubercular deposits." (p. 336.) That hæmoptysis sometimes, though very rarely in the male, is not followed by active phthisis, must be admitted; but considering the very great frequency with which the latter disease is ushered in by the symptom in question, and the fact that very limited tubercular deposits may exist for a long time and even undergo such cure as they are susceptible of, and all the while be undetected by physical methods of examination, it is more probable that tubercles exist than that they do not whenever hemorrhage from the lungs takes place without any other tangible cause for its occurrence. Nothing is said by Dr. L. of the age at which hæmoptysis occurs. Rilliet and Barthez saw no case of it in a child under seven years of age; but one is reported of a child about as many weeks old who died from this accident in the Bellevue Hospital.[1] Its lungs contained scattered miliary tubercles, but no cavities.

The subject of *physical signs* in phthisis is one which seems to have been almost exhausted by the numerous skilful physicians who have devoted themselves to its elucidation, and the indispensable aid which it renders is familiar even to the youngest and least practiced in the profession. It sounds strangely, therefore, when Dr. Copland tells us that physical diagnosis has been "paraded, over-estimated, and lauded" (p. 3), speaks of "the examination of the bared chest for the grand *coup* of fussy diagnosis" (p. 62), or thus: "Whilst a murmur, a bruit, a râle, a rhonchus, and every sound for which a term could be coined, and their various grades, cadences, &c., were heard, or were feigned to be heard, the conditions of the vital powers and functions were entirely neglected." (p. 262.) Probably, if we were compelled to depend for our guidance in diagnosis and treatment either upon physical signs alone, or exclusively upon whatever was known before Auenbrugger and Laennec enlightened the dark region of pulmonary pathology, we should unhesitatingly trust ourselves to the former; because, while its field is narrow its phenomena are definite and precise, and supply us with a foundation for diagnosis and practice without which our therapeutics of the early stage of the disease would not be more secure than castles built on air. Few writers of real eminence among those who have treated of phthisis are open to the charge which Dr. Copland makes, and few especially of those who have appeared in the latter half of that almost one-third of a century during which the learned author was compiling his valuable work. Dr. Lawson is not certainly of the number, but is one of those who think it just as important to be accurate in physical as in functional semeiology, but who regard the former as much more attainable than the latter. His account of both is fuller than that given by previous writers, and if at times we differ from and criticize him, it is because we think that the materials of his work are stout enough to bear a little trimming of their apparent superfluities and excrescences.

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[1] New York Journ. of Med., March, 1857, p. 233.

It is unnecessary to pass in review every part of his elaborate description; we shall only notice here and there a few points which suggest remark. Thus, *jerking or wavy respiration* is stated not to be a reliable sign of phthisis independently of dulness, dry crackling, or localized feeble or harsh respiration, because it occurs in various other conditions unconnected with phthisis. Certainly, if those signs are present, the one in question need not be regarded; but it is in their absence that jerking respiration becomes valuable, provided that no other sufficient cause of imperfect expansion of the lung exists. Such we have always found it. M. Bourgade, who has carefully studied the subject, arrives at the same conclusion, which he thus expresses: "If a patient presents the general symptoms of commencing phthisis and jerking respiration, the existence of the disease is rendered certain."[1]

Dr. Alison presents us with a very interesting rationale of bronchophony. It was the opinion of Laennec, and is so of auscultators generally, that this is a sign of pulmonary solidification when heard over the lung itself, whereas Skoda leaves this element out of view, and refers the phenomena to consonance of aerial vibrations in the larynx and the bronchia. But Dr. Alison shows that while a feebly vibrating column of air will generate a sound which can be heard better through the normal than through the solidified lung tissue, yet one which is capable of throwing the latter into vibration will, by its means, generate a louder sound than the normal tissue, and hence that consonance and increased conducting power are both necessary to explain bronchophony. Yet he agrees with Skoda that to the former the most of the result is to be attributed. Dr. Alison observes that a distorted and deformed shape of the chest is not apt to be connected with phthisis, and in this, we think, other physicians will agree with him. In an interesting chapter on thoracic arterial murmurs in phthisis, he describes the frequent occurrence of a blowing sound in the arteries near the seat of tubercular deposits at the apex of the lung, and ascribes it to pressure. Doubtless this cause may sometimes be operative, but tubercular anæmia is less considered than it deserves to be in this connection. So in attributing the increased loudness of the heart sounds in phthisis to the increased activity of the organ and to the destruction of the lung, he omits the element of thinning of the walls of the heart, and that of the watery condition of the blood. A phenomenon of some importance is that the vocal resonance is occasionally louder over the healthy than over the tuberculated lung. This may depend upon direct obstruction of the bronchia of the diseased organ, or its imperfect expansion in consequence of contraction of the thoracic walls. To all such cases, and others in which different degrees of the same phenomenon are to be studied comparatively on the two sides of the chest, the differential stethoscope is admirably adapted.

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[1] Archives Gén., Nov. 1858, p. 531.

Dr. Lawson calls attention to the fact that tubercular ulceration of the bowels and constipation may exist together. A remarkable example of this curious circumstance is reported by Dr. Fuller.[1] We have observed the same thing in typhoid fever. In connection with œdema of the feet in the third stage of the disease, Dr. L. might have noticed that form of it which is confined to one extremity and is caused by obliteration of the veins. Cases of the affection are reported by Dr. Cursham.[2] The general summary of the phenomena of chronic phthisis is very clearly, and, with certain exceptions already noticed, very accurately presented. The most characteristic of the early signs are stated to be emaciation, cough, and hæmoptysis; yet we are warned against the risk of basing a judgment upon any small number of symptoms, and two cases are adduced as illustrations, in one of which there was no cough and in the other no emaciation. Of the early physical signs, Dr. L., in common with diagnosticians generally, regards dry crackling as the positive representative of consolidated tubercle, but believes that another, which he terms "tubercular crepitus," is the true sign of tuberculoid fluid exudation. It is described as a little finer and drier than ordinary pneumonic crepitus, and is stated to have been heard when no other sign was present, and also upon the limits of tubercular consolidation.

Under the general title of *Inflammatory Phthisis*, Dr. Lawson describes several forms of disease, to which the application of this name is, at least, of doubtful propriety. They merely comprise cases in which pneumonia, bronchitis, or pleurisy appear to favour the degeneration, if not the development of tubercle. The first variety, "Parenchymatous or Plastic Pneumonic Phthisis," is described as "ordinary pneumonia with plastic exudations ultimately tending to tubercular deposits." "It is evident," the author adds, "that pulmonary inflammation often becomes the direct inducing cause of phthisis, and imparts to the whole course of the affection an inflammatory grade of action." We have already stated what we conceive to be the true relations of phthisis and pneumonia, and shall not describe them anew, but will only remind the reader that the cases in which tubercles even appear to be the result of pneumonic inflammation are extremely rare, while in the greater number there are conclusive reasons for regarding the tubercles themselves as the primary affection. It cannot be denied that they very frequently occasion intercurrent pneumonia, which is neither dangerous itself, nor seriously mischievous in its action upon the greater number of cases in which it occurs. In regard to "Vesicular Pneumonic Phthisis," which is used as synonymous with "gray tubercles, gray semi-transparent granulations," &c., reasons have already been given for the doctrine, from which Dr. Lawson (following Andral's opinion) is one of the few dissentients, that these bodies are in no essential respect different from the tubercles of chronic consumption. Yet Dr. L. expressly refers to cases which have been of sufficient duration to allow of their "transformation into yellow tubercle," and he might have added that Laennec speaks of one in which even softening of the deposit took place within a month from the commencement of the attack. In a word, gray semi-transparent granulations constitute the proper anatomical character of nearly all cases of acute tuberculosis of the lungs, and their transformation into yellow tubercle, and subsequent softening, depend solely upon whether the patient survives long enough for these changes to take place. The third variety of acute phthisis described by Dr. Lawson is the "Broncho-pneumonic," by which term he denotes the cases which supervene on chronic bronchitis and broncho-pneumonia. Reasons have already been given for excluding these affections from the category of causes directly productive of phthisis, while we grant that in common with every debilitating agency, they may become the immediate forerunners of consumption in those who have a proclivity to the disease. But it is undeniable that in the majority of cases of acute phthisis, neither bronchitis nor pneumonia has preceded the development of the symptoms peculiar to the tubercular affection. If anywhere they appear as antecedents of consumption, it is when they are themselves chronic and precede the chronic form of the organic disease. The same remark is applicable to what Dr. Lawson terms "Pleuritic Phthisis;" indeed, this author admits that the agency of pleurisy in its production "must generally be incidental or indirect."

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[1] Trans. Lond. Path. Soc., xi. 103.

[2] Med.-Chir. Trans., xliii. 377.

As this form of disease is not very fully presented by the author just named, nor as accurately as the present state of knowledge regarding it requires, we shall offer a brief sketch of the more recent and authoritative expositions of its forms and nature. Dr. Copland describes a "primary or rapid acute phthisis" and a "consecutively acute phthisis." The latter is only "an acute or actively developed state of the pre-existing chronic disease." The former he divides into two varieties: "that in which the more characteristic phenomena of phthisis are present in a remarkable or severe degree;" and "that in which these phenomena are nearly if not altogether absent; the disease being often mistaken for low, nervous, or typhoid fever." In both of these forms, Dr. C. admits the pre-existence of latent tubercular deposits, and Lebert states that, after death, old tubercles are found in the lungs and bronchial glands. The first named author enumerates, as occasional or exciting causes, eruptive fevers, various inflammatory affections of the lungs, and severe physical exertion; of these Lebert mentions measles only, and concludes that in the majority of cases the true occasional causes are unknown.

The first accurate history of this affection based upon a sufficient number of cases was published by Waller, in 1845,[1] although it had previously been more or less accurately and fully described by Morton, Portal, Bayle, Laennec, Andral, and particularly Louis. He refers to two anatomical forms in which it occurs, the miliary and the infiltrated; and, according to their course, he divides the cases into Typhoid, Catarrhal or Bronchial, Gastric, Intermittent, and that masked by Delirium Tremens. He regards the diagnosis of the first mentioned form from typhoid fever as extremely difficult, since active delirium, disturbance of the respiration, copious sweats, the absence of abdominal symptoms, the character of the cutaneous eruptions, and even the enlargement of the spleen may be met with in either disease. Indeed the chief symptomatic distinction he finds in the less regular development of the symptoms in acute tuberculosis. In some cases he believed that the two affections co-existed; and in others that the tuberculous followed the typhoid affection. The *catarrhal* form owes its peculiarities to the accompanying congestion, œdema, or emphysema of the lungs. In one variety the attack is preceded for a few days by violent cough, or begins with a heavy chill and continued fever. The respiration is very hurried, laborious, and short, and the dyspnœa extreme; the cough is violent and produces a copious expectoration of frothy, albuminous sputa, streaked with blood. Percussion is normal or tympanitic, and the rhonchi are those of bronchitis. The face is pallid and very anxious, the skin hot, pulse 130—150, the ankles œdematous, and the loss of flesh and strength rapid. After a few days the lips and hands and feet become cyanotic, and death by "paralysis of the lungs" takes place. Besides the evidences found of catarrh, œdema, and emphysema of both lungs, these organs contain numerous disseminated tubercles. In another variety the symptoms are less intense and of longer duration, and are accompanied with tubercular infiltration. This anatomical condition renders it more possible than in the other form, to recognize the state of the lung. The signs of a tubercular mass may, however, be due to a pre-existent and chronic deposit. In many cases vomiting and gastric pain are observed. The third form described by Waller, is the *gastric*, in which the symptoms just mentioned, with catarrh of the pharynx, and diarrhœa, precede and accompany the typhoid or catarrhal states. The disease, according to this author, may wear the mask of *intermittent fever* at first, but finally merges into one or the other of the forms just named. It is asserted that the deposit of tubercles takes place so rapidly during the paroxysms as to allow its increase to be estimated from day to day. The commencement of the attack may also be masked by *delirium tremens*. It is stated by Waller that acute *tubercular infiltration* of the lung always presents the symptoms of pneumonia, and cannot be clearly distinguished from it. Rokitansky makes a similar statement.[1]

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[1] Prager Vierteljahrschrift, vi. 1.

The most complete exposition of this affection which has yet been published is that of Lebert,[2] which is based upon no less than forty cases recorded by himself. He states that in more than one-third of the fatal cases, old tubercles were found at the apices of the lungs. The pulmonary tissue around the recent granulations was generally quite sound or only slightly congested; but all grades of solidification were also observed. Twice the larynx was deeply ulcerated; in one case the epiglottis being nearly destroyed. The follicles of the larynx were generally enlarged, but not tuberculous. Five times tubercles of the brain were found, and in the small intestine ulcers of the glands were present in one-third of the cases. This author presents a full description of the symptoms of the disease, but our limits will not permit us to do more than notice the forms which he has found it to assume. These are: 1. The Latent Form, or the Gastric Form of Waller. The symptoms are those of gastric fever, with rapid and extreme emaciation, but neither cough, dyspnœa, nor thoracic pain. The only physical signs are catarrhal rhonchi. The patient rapidly runs down and is apt to die suddenly. Three cases of the sort were observed by Lebert. 2. The Proper Tuberculous Form affects one-half of all the cases. In it the fever is intense, the debility extreme, the breath very short and quick, the cough harassing, the sputa sometimes bloody. Percussion affords no definite signs, and auscultation reveals sonorous, sibilant, and fine crepitant rhonchi, and perhaps some blowing at the summits. Diarrhœa, colic, meteorism, depend upon intestinal ulcers; and vomiting, hardness of the abdomen, and ascites upon tubercular peritonitis. The fever has generally a typhoid type. 3. The Cerebral Form is next in frequency, although much less frequent than the last. Along with characteristic fever of a typhoid type are observed disorder of the senses, paralysis, spasms, and, in addition, the chest symptoms already referred to. 4. The Masked Form is rare, and is characterized by the prominence of the symptoms of some other disease which conceal that of the lungs. Delirium tremens or intermittent fever, as Waller states, or laryngitis, pneumonia, or pericarditis, may hide the more important affection. The diagnosis of the disease is confessed by all to be extremely difficult in many cases, and especially, in one of its forms, from typhoid fever. This fact must render us slow in accepting as cases of cure some which appear to be so. The possibility of cure is, however, established both by Waller and Lebert. The former affirms that the fact is indubitable, and the latter witnessed recovery in six cases. In four persons who afterwards died of other diseases, the evident traces were discovered of miliary tuberculosis in a state of cure; that is to say, the tubercles were found inclosed in a black pigment.

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[1] Lehrbuch, 3d ed., iii. 301.

[2] Handbuch der prakt. Med., ii. 105.

Dr. Lawson says of *laryngeal phthisis*: "As described by Trousseau and Belloc, laryngeal phthisis is a chronic inflammation, upon which tubercular deposits may or may not be engrafted." This is scarcely a correct statement. The authors named used the word phthisis in the sense which was attached to it by all writers before Laennec, viz., a disease which proves fatal by wasting. Confining their attention to such diseases of the larynx, they described a simple, a sympathetic, a cancerous, and a tuberculous, laryngeal phthisis, and they defined the last named one to be "that form which begins to show itself *after* the existence of pulmonary tubercles can be detected."[1] Dr. Lawson, therefore, inverts the order of succession of the laryngeal and pulmonary affections as it is given by Trousseau and Belloc.

Dr. Lawson suggests a reason why in certain cases tuberculosis fixes itself in the larynx. He supposes that in the "diathetic state," casual irritations of the larynx determine the development of tubercles in this organ rather than in the lungs; and he adduces the inordinate use of the voice, the inhalation of irritating substances, as causes of this nature. Unfortunately, however, for the stability of this conclusion, it is not a fact that any of these persons are peculiarly liable to laryngeal phthisis. Grinders and others who inhale irritating particles suffer from bronchitis and not from laryngitis.

Dr. Lawson admits that when phthisis begins in the lungs the larynx becomes involved in tubercular disease, and indeed declares that all the cases of laryngeal phthisis which have fallen under his observation were associated with pulmonary tubercles. Yet he affirms that in laryngeal phthisis, properly so called, the disease must begin in the larynx and trachea, and predominate in them throughout its entire course. Indeed, he goes farther, and lays down as a diagnostic point that in laryngeal phthisis the morbid action begins *in the throat:* Or, still more specifically he asserts that "there is an *idiopathic* laryngeal phthisis and a *secondary* laryngeal affection, the latter a mere sequence or complication of ordinary chronic phthisis. The laryngeal affection which is generally idiopathic *begins in the throat.*" (p. 404.) We have shown elsewhere that follicular inflammation of the throat has no relation, either causative or coincident, to tubercular disease of the respiratory organs, and now need only remind the reader of this fact, which is so persistently ignored by the author of the work before us. We have further to notice the still more erroneous assertion that there is such a disease as idiopathic laryngeal phthisis independent of cancer and syphilis, and of tubercles in the lungs. This proposition forms the basis of a system of quackery which certain unscrupulous practitioners of medicine, at home and abroad, have inaugurated and built up for the purpose of deluding the unhappy victims of consumption who are ever ready to grasp with the energy of despair whatever hope may be thrown out to them, however delusive may be its promises and how unsubstantial soever the succour it can afford. We regret to see it incorporated in a work which contains so much of scientific truth, and adopted by an author whose sagacity, experience, and skill impart to his conclusions a peculiar weight. At the risk of appearing prolix, we feel the question to be of such importance as to warrant our quoting, for the information of those who have not had leisure to study the subject for themselves, the conclusions of some of those pathologists whose original investigations have most largely contributed to settle the laws of tubercular disease.

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[1] La Phthisie laryngée, p. 90.

Louis originally established the pathological law, that in phthisis ulcers are more numerous in the larynx than on the epiglottis, and in the trachea more so than in the larynx.[1] He found also that in 18 cases in which the epiglottis was ulcerated without the participation of the larynx or trachea in the lesion, the pharynx and the tonsils were perfectly healthy. (p. 296.) Finally, as showing the close connection of ulcers of the larynx and trachea with tubercle, he found no instance of their occurrence in five hundred autopsies of persons who had died of chronic diseases other than phthisis. (p. 55.)

Trousseau and Belloc testify as follows: "We recognize the existence of tubercular laryngeal phthisis whenever there is at the same time confirmed consumption of the lungs. So that in the former disease we shall find the signs of tubercular pulmonary consumption superadded to those of simple laryngeal phthisis."[2] Again, "We conclude that in tuberculous laryngeal phthisis, death by consumption is due not so much to the disease of the larynx as to the other organic lesions which accompany rather than follow it. In fine, tuberculous laryngeal phthisis is only the local expression or manifestation of a general disease." (Ib., p. 239.)

Dr. Stokes says: "Indeed, what is called phthisis laryngea seems to be, in almost all cases, phthisis pulmonalis."[3] And again, "I can avow, that after ten years of hospital and private practice, I never saw a case presenting the symptoms of laryngeal cough, purulent or muco-purulent expectoration, semi-stridulous breathing, hoarseness or aphonia, hectic and emaciation, in which the patient did not die with cavities in his lung."[4]

The immense experience of Grisolle and his consummate skill in observation led him to this conclusion: "In the numerous autopsies I have made in the course of twenty-seven years I have never seen a case of primitive ulceration of the larynx, and I have met with no authentic example of the sort in any work."[5]

Hasse expresses himself thus: "Nor am I aware of any instance of the larynx and trachea running through a course of tubercular disease independently of pulmonary phthisis," and he adds, "in most cases the pulmonary affection pre-exists."[6]

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[1] Op. cit., p. 52.

[2] Phthisie laryngée, p. 225.

[3] Diseases of the Chest, p. 246.

[4] Ib., p. 254.

[5] Pathologie interne, 7ème éd., i 330.

[6] Path. Anat., Syd. Soc. ed., p 355, 356.

Among the cases observed by Dr. Cless, of Stuttgardt, "not a single one appears where the tuberculosis or ulceration of the larynx and trachea formed the primary and predominant affection; it was always secondary, and attendant upon simultaneous disease of the lungs."[1]

Even Dr. Cotton is obliged to confess, when speaking of laryngeal phthisis, "Perhaps, in every case of its occurrence, the lungs are found to be likewise tubercular."[2]

In his treatise on Pathological Anatomy, Foerster says, "Tubercle of the larynx is commonly, indeed almost always, an epiphenomenon of pulmonary tuberculosis, and extremely rare as a primary affection."[3]

In a very thorough examination of the subject of laryngeal ulceration, Dr. Rheiner declares that "strictly speaking there is scarcely such a disease as tuberculosis of the larynx,"[4] that is to say, independently of tubercles in the lungs.

Copland states the doctrine thus: "In laryngeal phthisis the affection of the larynx is merely symptomatic of tubercular formations in the lungs."[5]

Lebert, whose authority on this subject is perhaps superior to that of any other man, because he is equally distinguished as a practitioner of medicine and as a pathological anatomist, assures us that he "never met with an example of an idiopathic ulcer of the larynx." He even disbelieves the existence of tubercle in the laryngeal follicles, saying: "I have never detected tubercular matter in laryngeal ulcers. The so-called crude tubercle of the mucous membrane is nothing more than a swollen follicle containing its proper secretion in a state of fatty metamorphosis."[6]

Finally, the general law of the subject is laid down thus by Rokitansky: "Tubercles of the intestine, the *larynx and trachea*, the serous membranes, the spleen, and liver, occupy a very subordinate position, because they occur more or less rarely, indeed almost never, as primitive formations."[7]

It cannot be doubted that the doctrine expressed in these quotations is that of all the leading pathological writers whose judgment would be deserving of any weight in reference to the present subject. When, therefore, Dr. Lawson speaks of a laryngeal phthisis "which is strictly *idiopathic*, begins in the *pharynx*, and involves, as a general rule, the *tonsils*, *mucous follicles*, larynx, and trachea," (p. 404,) he is describing that which either has no existence in nature, or if it exists, has remained invisible to all the most eminent cultivators of pathology.

The *treatment* of phthisis is discussed by Dr. Lawson in a number of separate sections, in which are successively considered the management of The Precursory Stage, that of Tubercular Deposits, of Softening, of Cavities, the treatment of Incidental Symptoms, and of Complications. A chapter is specially devoted to Inflammatory and Acute Phthisis, and another to Special Questions, particularly Sea Voyages, Change of Climate, Gestation, and Topical Medication.

If this method renders necessary the repetition of many statements under the several heads, and therefore adds much to the author's labour, and something to the trouble of the reader who desires to learn the value of the different remedies discussed, it has the important practical advantage of grouping together the considerations applicable to each successive stage of the disease, and therefore of rendering the precise information which is desired more readily accessible to the practitioner. Of this division of the work, as a whole, we think that a very favourable judgment will be pronounced. It displays, generally, a just appreciation of the relative value of remedial measures in pulmonary consumption, and describes with clearness and propriety the special indications and the most successful methods of meeting them which are presented in the various forms, grades, and periods of the disease.

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[1] Ranking's Abstract, Am. ed., 1845, Pt. ii. p. 57.

[2] On Consumption, p. 172.

[3] Patholog. Anat., ii. 217.

[4] Virchow's Archiv, v. 549.

[5] On Consumption, &c., p. 85.

[6] Handbuch d. prakt. Med., i. 973, 969.

[7] Op. cit., i. 306.

The subject of *climate* as a remedy in pulmonary consumption has been discussed in all of its relations by a great many writers, and certain general conclusions have been arrived at which may be true of the majority of a given number of cases, but which are utterly fallacious in their application to individual instances. The same is, however, true of all therapeutical rules and principles, and every case of disease requires a mode of treatment adapted to its peculiarities. Observance of this rule only can insure success, and it is in perceiving and being appropriately guided by it that certain practitioners display sagacity and obtain more favourable results than their less acute brethren. It may be very true, for example, that in a warm climate phthisis is less prevalent than in a cold one, but it by no means follows that all consumptive patients would be benefited by a change from the latter to the former. Humidity and heat will pretty certainly be more mischievous than a dry and cold atmosphere, at every stage of the disease, and none the less for the malaria which accompanies the former during the summer and autumn, and which has been imagined to act as an antidote to tuberculosis. *A dry atmosphere and an equable and not extreme temperature*, are the two essential elements of a climate favourable to persons affected with this disease. Such an one in this country, Dr. Lawson says, is enjoyed by the eastern portion of Tennessee, the high pine woods of the Carolinas and Georgia, and the middle and northern portion of Texas. He is also of opinion that an analogous climate will be found in New Mexico, Santa Fe, California, and Oregon, and that these places are suitable resorts during the winter season. In summer, on the other hand, the North Western States, and especially the region about St. Paul, is recommended as remarkably salubrious. The peculiarities of the climate in most of the American and foreign resorts for consumptive invalids are very fully and intelligibly described by Dr. Lawson, particularly in the chapter devoted to Special Questions in the treatment of Phthisis. Dr. Copland treats of this subject quite at length and in some respects more minutely. As Dr. Lawson very appropriately remarks, however, the mere change of atmosphere, diet, and general associations, acting on both body and mind, modifies the common condition of the system, interrupts the morbid action, and restores the healthful play of the vital powers. Yet, in making choice of a residence for a consumptive patient, we must not be influenced by atmospheric conditions alone. To exile a person accustomed to the relatively complete and mechanical civilization of our northern cities, where every thing breathes comfort, and every want, every caprice, even, can be gratified, for life in a public house, ill built, rudely furnished, foul from untidy house-keeping, surrounded within doors by a crowd of wan and ghostly invalids, forever comparing notes of their pulses and their pains, their loss or their gain of weight, their ingesta and excreta—this is to condemn him to despair and premature decay, and fill with flints and thorns the pathway which to the last step of its decline should be bathed in sunshine and perfumed with flowers. Whatever locality is selected, if any must be away from home, let it be where the body may be invigorated by active exercise, or by protection at least from hostile influences, and the mind at the same time refreshed by the presence of natural objects, or the study of works of art, and as much as possible diverted from that sad self-contemplation to which all invalids are prone.

Among the medicinal agents for the treatment of phthisis, Dr. Lawson ranks iron very highly, and recommends it associated with quinia. The iron treatment, indeed, he regards as an essential part of the therapeutics of tuberculosis, and as adapted to every form and condition of the disease (pp. 420 and 436); but he fails to notice a special indication for its use which we regard as essential to securing its benefits. It was very distinctly laid down by Morton, who says: "*If the hectical heat be moderate and almost insensible*, ... the patients must be put upon the use of chalybeate waters in the summer. By this means I have relieved a great many of this kind of consumptive persons for many years, restoring their appetite, their flesh, and strength, abating their hectic heat and cough, and giving them a greater freedom of breathing, and that not only during the time of their drinking the waters, but also all the next winter."[1] The condition here insisted upon we have repeatedly found to be essential to a successful use of the medicine, for, when it was disregarded, hemorrhage has almost invariably resulted. We quite agree with Dr. Copland in his opinion that the effects of chalybeates of all kinds require to be closely watched in every stage and state of the disease, and while giving them in cases of very chronic phthisis without fever and with a limited deposit of tubercle, we cannot forget how completely Louis failed to realize the promises contained in the ardent and highly-coloured eulogy which Dupasquier pronounced upon the iodide of iron.

Dr. Lawson is also convinced of the usefulness of quinia in the forming as well as in the subsequent stages of phthisis, by improving the tone of the nervous and digestive systems, and of the capillary circulation, and by preventing the occurrence of chills in all stages of the disease. Dr. Copland appears to restrict its use to conditions in which it is desirable to have recourse at the same time to an acid and to an astringent, while Dr. Richardson regards it as of great value where the hectic attacks are regular. We believe that it is then almost exclusively that the medicine is of decided although of temporary utility. When a tonic influence is required, we regard cinchona or its extract as much superior to quinia. But neither can possibly operate more advantageously than a host of other remedies which may indeed palliate particular symptoms of consumption, but have no power to alter the diathesis out of which it proceeds, or to check the progress of the disorganization to which it naturally tends.

The proper regulation of the diet in consumption is of more consequence than the administration of medicines. The accepted doctrine of the profession is that the food should be very nutritious, and, if the stomach is unable to assimilate it, that active exercise and alcoholic stimulants should be resorted to for strengthening the digestive powers. Horseback exercise, and beefsteak and porter for food, are prescribed as the representatives of this view of the subject. Dr. Lawson thinks that there is an error in the practice; that our object is to check the perverted transformation, which could hardly be accomplished, he says, by crowding into the system large proportions of nitrogenous elements of food, which actually render the oxidation of the tissues more active. Hence, besides articles which contain fat, he would recommend potatoes, wheat bread, rice, &c. We find, however, that he specifies beef, mutton, venison, birds, chickens, fish, and oysters, as appropriate animal food, and we are sure that no one need complain of such a bill of fare. In practice he is, therefore, like most other men, superior to his theory. A similar fact may be noticed of Dr. Bennett, according to whose theory consumptive patients ought to be dyspeptic and unable to tolerate animal food. He also proscribes farinacea because they produce the acidity which is required for the production of tubercles in his theory of their origin. Nevertheless, he tells us that the diet should be "of a nutritious kind, consisting of a good proportion of animal food abounding in fat;" but he takes care to add—what is indeed the essential condition of such a diet's utility—that exercise, the strongest stimulant to appetite, must be taken actively and habitually. It is worthy of notice that Morton strongly insists upon a highly nutritious diet, as game, shell-fish, animal broths and jellies, in the more chronic forms of the disease; while in its febrile condition, he recommends milk—particularly asses' milk. Guéneau de Mussy says that the food should be substantial and strong, proportioned, however, to the power of the digestive function, and he gives the good advice to avoid all ragoûts, spices, salt meats, pastry, confectionery, and everything which expends the power of the stomach without affording nutriment.

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[1] Op. cit., p. 160.

In reference to the use of alcoholic stimulants in phthisis, Dr. Lawson has some very judicious remarks. He says that they improve digestion, promote nutrition, and protect the tissues from a too rapid oxygenation. He very wisely dissuades from their use in the laryngeal complications of the disease, and concludes, that while they are most useful for persons of a phlegmatic temperament, they are least so in the bilious. Malt liquors, he remarks, will be best adapted to the sanguineous temperament (which, however, is rarely that of consumptive persons), ardent spirits to the lymphatic, and wines to the nervous. Dr. N. S. Davis[1] has endeavoured to prove that there is no evidence that alcoholic stimulants are capable of either preventing or retarding the development of tubercular phthisis. For this purpose he inquired into the previous habits as regards temperance of a certain number of consumptive patients in a hospital. Evidently, this is entirely irrelevant matter. If the population of a place could be divided into two or more parts, according as they abstained from or used alcoholic beverages in moderation or in excess, and the percentage in each one could be determined, a partial solution of the question might be attempted. But even then the influence of other causes favourable or unfavourable to the disease would have to be estimated; and this is perhaps impossible. For example, it is certain that females are less addicted than males to the use of alcoholic drinks, so much less so that if no other causes interfered, and if alcohol is *per se* anti-phthisical, they should present a much greater mortality than males from phthisis; whereas, we know that if the two sexes differ at all in this respect, the difference is in favour of the males. Again, the intemperate use of alcoholic beverages may, by its debilitating influence, tend to precipitate the development of tubercles in those who are predisposed to them, while their moderate employment may invigorate all of the physical powers and ward off the imminent danger of the disease. The question is scarcely one which can be solved statistically; but we suspect that alcoholic drinks will continue to be prescribed, either theoretically, because they diminish the waste of the system just as fatty nutriment does, or practically, because they who employ them in moderation, along with their food, and in conjunction with active muscular exercise, feel all the better for their use. As for the suggestion that to prescribe them is to foster intemperance, it savours very much of the spirit which withheld men from deeds of mercy lest the ritual of their religion should be infringed. It is very certain that neither alcohol nor any other medicine or agent whatever can much diminish that vast crowd, one-seventh of the whole multitude of human beings who annually perish in many nations; and if there be those who lift their eyes in pious horror that here and there a consumptive has sunk into the drunkard's grave, let them, if possible, be comforted by the reflection that by means of this potent elixir many a life has been prolonged to benefit society, and to brighten those golden chains of love which link families together, and friends to friends.

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[1] Trans. Am. Med. Assoc., xiii. 565.

The use of *cod-liver oil* is fully considered by Dr. Lawson. His results agree in the main with those of other observers who have published their experience since the first exaggerated statements upon the subject were made. He agrees with all others that it is a common occurrence for the pulmonary disorganization to proceed uninterruptedly even while the weight of the patient is increasing. He presents us with none of those surprising cures which appear to have taken place in the practice of a few physicians. He admits that the oil often disagrees with the stomach, especially in persons of a bilious constitution, and is of opinion that in the second stage of the disease, its free use tends to obstruct the pulmonary capillaries, and thereby to favour the local disease. In the third stage, or that of cavities, Dr. Walshe believes that it relatively produces more marked effects than in the previous stages; but of this period Dr. Lawson speaks despondingly, and qualifies his hope of its benefits by the expression "if cavities are ever healed." It may be interesting to the reader to learn the opinion arrived at by so accomplished a physician as Lebert. He has expressed it in the following terms:—

> "It is undeniable that in an early stage of the disease, with appropriate hygienic treatment, and after many months' use of the oil, the course of a moderate proportion of cases is rendered milder and slower, and that more patients are improved, or even temporarily cured, than by a merely expectant treatment. In advanced phthisis the medicine is of less utility; but it is occasionally useful by diminishing the colliquative sweats and delaying the emaciation: many patients it temporarily benefits, and some even permanently. It is a precious but by no means a specific remedy in phthisis, and has no direct influence upon the process of tuberculization."[1]

The *topical medication* of the fauces and air-passages finds an advocate in Dr. Lawson, who, if he does not go the whole length of some who have written upon the subject, yet lays himself open, in more than one place, to serious criticism:—

> "The removal of a portion of the tonsils," he remarks, "is particularly insisted upon by Dr. Green; and, according to his extensive observations, great benefit is derived from the measure. When these glands are found secreting morbid material, and exhibiting diseased action throughout their substance, I am satisfied that great benefit will be derived from the excision of the diseased portion." (p. 429.)

Very possibly *when* the supposed case exists, the treatment mentioned may be appropriate. But we can say emphatically that no such case has ever fallen under our observation, and we are not acquainted with a single author, except such as have copied the statement which Dr. Lawson himself borrows, who has described this condition of the tonsils as an incident of phthisis. We cannot but regret, therefore, that Dr. Lawson should not have presented us more explicitly with his own experience in regard to this alleged complication.

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[1] Handbuch, ii. 145.

Dr. Lawson declares himself to be "fully persuaded that in the initial stage of laryngeal phthisis the judicious employment of leeches, counter-irritants, and the internal application of the nitrate of silver, *may arrest the disease*." (p. 514.) As we have already seen, he admits that the laryngeal ulcers of phthisis are due to the softening of tubercle (p. 403); yet we are called upon to believe that not only is this local application competent to procure the cicatrization of such ulcers, but to prevent new ones from forming, originating as they do, not from a local irritation, but from a constitutional cachexia! He leaves out of sight altogether the still more important fact which we have already shown to be established by the concurrent testimony of all pathologists, that tuberculization of the larynx implies the same condition of the lungs. Far be it from us to depreciate the value of topical applications, liquid, pulverulent, and gaseous, in this affection, but we do most positively aver that no case of it was ever cured by them. Its more distressing symptoms may be mitigated, they may possibly be for a time suspended—although of this we have never met with an instance—but that they have been cured no evidence has yet been furnished. They who affirm that this miracle has been performed surely do not reflect how heavily they tax our faith. If there are no signs of pulmonary tuberculosis, upon what grounds are we asked to believe that the laryngeal affection is tuberculous? Can it be distinguished by its proper local symptoms from syphilitic ulceration of the organ, or from other forms of chronic, non-ulcerative laryngitis? The distinctive sign, according to Dr. L., of coincident faucial inflammation has not been visible to other observers. We are, therefore, left without any satisfactory diagnostic character of laryngeal phthisis, unless we recur to that of the simultaneous indications of tuberculous deposit in the lungs, and, if these exist, we shall surely not be pressed to believe that a cure of the laryngeal disease is possible.

In regard to applying medicinal substances to the air-passages, Dr. Lawson refers to medicated fumes and watery vapours, and impalpable powders of various stimulant or astringent substances, as occasionally of use; but he thinks, in common with most other practitioners, that when the larynx is the principal seat of disease, nitrate of silver is incomparably the best application. It surprises us not a little, however, to observe that he both believes in the feasibility of introducing a probang into the air-passages, and advocates its use:—

> "It has now," he remarks, "been proven that the *sponge-probang* and *elastic tubes* can be introduced into the larynx without serious inconvenience to the patient. Having been in the habit for years of introducing the sponge into the larynx, and more recently the elastic tube, I am not permitted to doubt the practicability of these operations." (p. 543.)

Other physicians there are who entertain quite as little doubt as our author upon this subject, and would have us believe that it is quite as easy an operation as the introduction of a catheter into the urethra, or even easier it may be. Dr. Scott Alison, at his first essay, "found some little difficulty, but after this, acquiring confidence and some tact in its performance, all difficulty soon vanished."[1] Dr. Prosser James does not think that those who oppose the practice have given it a candid consideration, and feels it "somewhat unsatisfactory to be assured that no probang can pass beyond and between the vocal cords," and yet for this assertion to be followed by confessions that "a tube may be introduced for the purpose of artificial breathing."[2] The only wonder is that Dr. James should ever have imagined so strange a proposition as that because a smooth and open tube may sometimes be tolerated by the larynx, therefore breathing can be performed through a body impermeable to air. As for Dr. Alison's remark, it was evidently made while he was yet in his novitiate of the art and mystery of laryngeal cauterization. But that a physician of so much intelligence, information, and experience as Dr. Lawson should, in the face of demonstrations showing the all but physical impossibility of the operation, hazard so definite an affirmation as the one we have quoted, without affording us even a glimpse of the grounds upon which his conviction rests, is a fact which we are wholly at a loss to explain.[3] Dr. Lawson must know very well that the greater number of those who affirm the feasibility or the facility of the operation are justly open to the suspicion of a want of candour; several of them, indeed, being of that class who write thin octavos and puny duodecimos, full of startling assertions, as seemingly a more legitimate and certainly a more successful mode of advertising themselves than a paragraph published in the columns of a newspaper, but one not a whit more fitted to inspire confidence in their integrity or their skill.

As we have seen, Dr. Lawson assures us that for years he has been in the habit of introducing the sponge into the larynx, but offers us no proof of the fact except his own conviction, which is most respectable presumptive evidence, certainly, but not a demonstration. Dr. Lente, of Cold Spring, N. Y.,[4] appears also to have been astonished at the rashness of denying the possibility of the operation, for Dr. L. had a case which he thinks "completely settles" whether a sponge can be passed into the upper opening of the larynx, "and to a certain extent" also its passage through the chordæ vocales. On meeting with this statement, we eagerly read the writer's narrative, hoping to find in it a demonstration which elsewhere we had sought diligently but in vain. To our surprise it turned out that a patient had a small fistulous opening in the trachea, and when a solution of nitrate of silver was applied to the upper orifice of the larynx the edges of the opening were found to be stained. The author then adds: "This case establishes the fact that it is practicable to introduce *the sponge* into the larynx, and to introduce medicated solutions (*I do not say the sponge*) into the trachea." It of course proves nothing more than that the caustic solution entered the trachea on the application of the sponge to the laryngeal opening, a fact which we are not aware that any body has thought of calling in question.

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[1] The Medication of the Larynx and Trachea, p. 3.

[2] Sore Throat, &c., p. 42.

[3] The originator of the alleged operation, Dr. Green, pitched his description and laudation of it on a key which Dr. Lawson does not attempt to reach, and even awakes that much enduring bird, the American eagle, to a shrill scream in his behalf. He claims that the sponge probang "has been in a thousand instances" thrust down "between and beyond the vocal chords, and has been carried not only through the trachea and its bifurcations, but at different times, and in the presence of more than five hundred *different* medical men, has been passed at will, into the right or left bronchial divisions! I shall now give proof . . . of our ability, *as Americans*, to accomplish still more than this for the treatment of thoracic diseases; to perform operations of which conservative Englishmen and sceptical Frenchmen have never dreamed." (Amer. Med. Monthly, Jan. 1855, p. 11.) We had not supposed that Americans could thus impliedly be accused of carrying off the palm for credulity.

[4] N. Amer. Med.-Chir. Rev., ii. 78.

In truth, the weight of evidence against the assumption (for it is nothing more) that the sponge of a probang can be safely introduced into the larynx and trachea is wholly overwhelming. We need only remind our readers that in a report presented to the New York Academy of Medicine in 1855, by Drs. Parker, Wood, Metcalf, and Stone, of a committee appointed to test the assertions of Dr. Green, it is stated that in no single one of all the trials made by them did the sponge satisfactorily enter the trachea. "In two instances the sponge was thought to have entered the larynx; but with repeated efforts it could not be passed between and beyond the vocal cords. The suffocation was so great each time as to compel a withdrawal of the instrument."[1] It is also pretty well known that an anatomist and surgeon of no less eminence than Mr. Erichsen, upon purely anatomical grounds, as well as experiments, denies that the sponge probang has ever "in the living subject been passed beyond the true vocal cords."[2] Mr. E. very pertinently asks how should the sponge be withdrawn if it once had passed this barrier? The cords, like the edges of a buttonhole, would immediately close against the whalebone handle, and the sponge could only be extricated at the risk of lacerating the vocal ligaments and their investing membrane, or else the sponge itself might be left behind in the air-passages. In 1855, Dr. Horace Green, in a paper published in a medical journal,[3] and also presented to the Medical Society of the State of New York,[4] printed a letter from M. Trousseau, who says: "Never, either before or since the publication of your labours, have I attempted to introduce into the larynx or the trachea a sponge saturated with a caustic solution;" and Dr. G. leaves it to be inferred that his correspondent acquiesces in the justice of his own claim to have performed that operation. M. Trousseau's courtesy to a correspondent may have deterred him from expressing an opinion of its feasibility, but that he did not believe it possible, is very certain. Not only does he not mention affections of the larynx among those suitable for treatment by nitrate of silver, in the edition of his Therapeutics published in the same year, but in 1857 he is reported to have expressed himself as follows, in a clinical lecture:—

> "I have tried this operation very often after the directions of Dr. Green's treatise on the subject. I had tried it long before the appearance of that treatise, both on the living and on the dead subject. I have put all the good will possible into my experiments, and I have never been able to succeed. More than this, I have convinced myself that the operation, after this method, is impossible, and that it has never been accomplished by Dr. Green, or any one else."[5]

Dr. Ebert, of Berlin, is another of those who are unable to satisfy themselves that the larynx can really be entered by the sponge probang,[6] and the number might be indefinitely multiplied. For ourselves, we disbelieve it altogether, and confess that we need stronger reasons than any which have yet been adduced by its advocates to convert us from our unbelief to faith in an assertion which is at variance with our own observation, unsustained by direct proof, and against which every anatomical and physiological reason militates.

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[1] N. York Journ. of Med., July, 1855, p. 148.

[2] Lancet, Nov. 1855, p. 489, and Dec., p. 518.

[3] New York Monthly, Jan. 1855, p. 1.

[4] Transactions, 1855, p. 237.

[5] Med. and Surg. Reporter, Aug. 1857, p. 408.

[6] Edinb. Med. Journ., i. 54.

The operation of catheterism of the bronchial tubes for the purpose of injecting medicinal liquids, and especially a solution of nitrate of silver into the lungs, is spoken of favourably by Dr. Lawson, although less decidedly than laryngeal cauterization, because, as he remarks, he has had a less extensive experience of its effects. Dr. Green, by whom this method of treatment has been proposed, states that he was indebted to Dr. Marshall Hall for the suggestion of introducing an elastic tube into the larynx in order to show the passage of air through it, and prove thereby the possibility of introducing a sponge into the same organ. The analogy of the two experiments is not a very evident one, and its suggestion is not very creditable to the sagacity of Dr. Hall. It is singular, however, that Dr. Green, who borrowed from the treatise of MM. Trousseau and Belloc everything which he had before proposed in regard to the instruments used for the application of nitrate of silver to the larynx, even to the strength of the solution they employed, should have overlooked in that work a case of laryngeal disease reported by M. Fournet, who states that in its treatment he for the first time employed catheterism of the air-passages, which he also describes as an operation easily performed.[1] We pass by the absurdity of attempting to heal tuberculous cavities by means of any topical treatment whatever, to notice the question of the practicability, or rather the facility of introducing a flexible tube into the trachea, which M. Fournet represents as very great, and Dr. Green does not find difficult. On this point the Report made to the New York Academy of Medicine throws some light. It states that the operation had repeatedly been performed before, and even in ancient times; indeed, Dr. Green reminds us that in several cases of œdema of the glottis it had been used successfully by M. Sestier. It also states that with a tube having a large curve the attempt failed eight times out of nineteen, and when a tube with a small curve was used the failures were nearly constant. The apparent power of the patient to inspire and expire air through the tube was found still to exist, though in a less degree, when the tube was in the œsophagus. The opinion of the operator as to whether the tube is in the œsophagus or the trachea was also shown to be fallacious, unless founded upon the general phenomena. Indeed, these symptoms were only too characteristic. When the tube was in the œsophagus the phenomena were chiefly negative; the voice, however, was distinct, and retching and vomiting were usual. In the trachea, however, the presence of the tube, while it caused little or no retching, extinguished the voice and occasioned in every case but one most frightful evidences of suffocation. The committee concluded, therefore, "that in the great majority of instances where injections are supposed to have been thrown into the lungs through a tube, they have passed directly into the stomach." In Germany, Prof. Griesinger, of Tubingen, made numerous trials of the new method, and was at first disposed to regard it as easy of execution; but after longer experience he concluded that in nearly every case the tube had passed into the œsophagus, and had not entered the trachea at all. He was particularly struck with the inspiration and expiration of air which at first he supposed to come from the lungs; but he soon became convinced that if the stomach communicated with the atmosphere by an open tube, inspiratory and expiratory acts must be performed by this organ, as well as by the lungs, under the influence of the diaphragm.[1] We may therefore consider this newer invention in pulmonary therapeutics as having little more intrinsic value than its immediate predecessor, as being in fact little more than a new device in medical legerdemain.

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[1] Op. cit., p. 104.

A short chapter on the *prognosis* of phthisis concludes Dr. Lawson's work; it is less precise than we could desire, and yet more positive than we believe to be warranted by fact. Thus we find it stated, as the general professional opinion, that phthisis "is *measurably* if not absolutely incurable;" that the "precursory stage is *very largely* amenable to proper hygienic treatment;" and that "phthisis is, to *a certain extent*, a curable disease." On the other hand, we are assured, that "the present state of science justifies the assumption that tubercular exudation is susceptible of absorption; and, furthermore, that tubercular consolidations may liquefy and return to the circulation, or be eliminated through the bronchial tubes, leaving in either case a condition of actual cure." The correctness of the first of the assertions quoted above may well be questioned. We do not know where, in the literature of the subject, he will find such an opinion expressd as that phthisis is absolutely incurable, and as to its being "measurably" so, or "to a certain extent," we presume that whatever degree of incurability those words imply is admitted to exist. That the "precursory stage" is curable it is quite as impossible to deny as to prove affirmatively; that stage, as we have elsewhere shown, being a pathological figment. The absorption of tubercle, we must positively affirm, is not in the present state of the science a justifiable assumption. In physical science no mere assumption is justifiable. Nor can we for a moment admit that tubercle can liquefy and as such return to the circulation; nor yet that the cretification of tubercle or its elimination through the bronchial tubes can be regarded as an "actual cure." At the very most these changes indicate a suspension of the local manifestation of the tuberculous diathesis. Indeed, Dr. Lawson admits this to be true in many cases, and states that the "mitigation of the disease may prove only temporary, and at a period more or less remote, the morbid condition will reappear and progress to a fatal issue." Nothing can be truer than this, but it is not in harmony with expressions previously quoted.

If we examine the literature of phthisis, we shall soon be convinced that the idea of the absolute incurability of the disease was the offspring of an epoch almost fatal to the art of therapeutics, when inflammation formed the sole article of the pathological creed, when active measures for its cure consisted in the use of inordinate evacuations of blood and the secretions, and the mildest treatment was starvation. It was then that cases of phthisis ran their course most rapidly and least was said of even its temporary cure. But such a mode of cure was familiarly recognized even before the days of Auenbrugger and Laennec, and some writers claimed even more for medical art than its most sanguine advocates do at the present day. Sixty years ago Beddoes[2] wrote as follows: "Besides, shallow men, rendered insolent by success, loath to depart from prevailing opinions, have been satisfied to believe in the impossibility of *dispersing* tubercles, and, by consequence, of preventing or curing consumption in the great majority of instances." By way of proving the possibility of a specific being found for the disease, he cites the discovery of sorrel as a specific for certain scrofulous ulcers, and nitrous acid for some hepatic and venereal affections! And after charging physicians with timidity or indifference in regard to the subject, he refers to the twenty quarto pages of remedies for consumption published by Ploucquet! He then proceeds to state that "an effectual remedy for consumption appears to have been nearly ascertained," and this (the reader will scarcely believe it) was digitalis! "I daily see," he exclaims, "many patients in pulmonary consumption, advancing towards recovery with so firm a pace, that, I hope, consumption will henceforward as regularly be cured by foxglove, as ague by Peruvian bark." Yet, as we very well know, foxglove was destined to be added to the long list of remedies which he so unsparingly condemns.

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[1] Deutsche Klinik, Apr. and July, 1858, p. 151 and p. 285.

[2] Essay on the Causes, &c. of Pulmonary Consumption, Lond. 1799.

But, to go still further back, we find a higher authority than Beddoes vouching for the cure of consumption. Morton declares that crude tubercles do admit of a cure, either true or palliative, so that the patient "though he is sickly, and subject to fevers, even upon every little occasion, yet is able to do his ordinary business, and many times lives to grow old."[1] But this remarkable and astute physician did not strive to overstrain the truth, for he subjoins: "Every consumption, though it be cured, is apt to return upon the least occasion." "Yea, even after the most perfect cure of a consumption, there is reason to suspect that there are some crude tubercles yet remaining, which at length may, by often meeting with an occasion, be inflamed, and ripen into apostemes, and so at last become open ulcers." Modern science has not permitted a more favourable prognosis than this to be formed.

Tissot states, that the celebrated Swammerdam for many years expectorated calcareous concretions, and his lungs became a perfect quarry;[2] but his biography informs us, that he died in the last stage of marasmus at the age of fifty-three. Stokes refers to similar cases occurring in middle-aged persons.

Laennec, himself, declares that "art may perhaps render the progress of the disease slower, but not cause it to retrograde," yet he adds: "quite a number of cases prove that after the evacuation of a cavity, a cure is possible." (*Op. cit.*, p. 98.) And Laennec concludes, that "the cure of phthisis by nature is possible, but not by art." (p. 280.) Such, also, was Andral's belief, founded upon the examination of bodies in the lungs of which he found cicatrices, empty cavities, and cretified tubercles. Louis arrives at a similar conclusion, but adds this caution which we shall do well to heed: "Let us not delude ourselves respecting the virtues of medicines, but remember that in some cases the progress of the disease is spontaneously arrested and remains so permanently; while, on the other hand, after having remained stationary, for a long time perhaps, it may resume its course rapidly and without any apparent reason." (*Op. cit.*, p. 651.) A very elaborate investigation of the curability of phthisis by Rogée,[3] led him to conclude that tubercles may calcify when few in number, and that cavities may possibly heal, leaving a permanent loss of substance, or a cicatrix with calcareous or fibro-cartilaginous or cellular matter. On these grounds the author indulges the hope that many tuberculous patients will hereafter be saved, while he frankly confesses that thus far the cures appear to be generally due to the efforts of nature alone. Rokitansky likewise describes the cure of tubercle as possible by shrivelling (Obsolescenz), cretaceous transformation, or elimination after softening; but, he adds, this is of little consequence to the consumptive patient unless the tendency to tuberculous deposit ceases at the same time.[4] Dr. Stokes separates phthisis into two varieties, the constitutional and accidental, "in both of which" he affirms that "we may effect a cure;" but the reader of the present day will be surprised to learn that the treatment upon which this eminent physician depended when he wrote the words we have quoted, consisted among other things of leeches and mercury.[1] But these opinions were published twenty-five years ago, and were among the fatal fruits of the theory of the inflammatory origin of tubercle. Forget, a late eminent professor of Strasbourg, concludes his investigations relative to this matter as follows: "The only cases of tubercle susceptible of a permanent cure are those in which the deposits are small, few, scattered, and either remain undetected or of doubtful existence while the patient lives: other cases may undergo apparent cures, but they are only temporary, and sooner or later terminate fatally."[2] Dr. Pollock has observed that many persons get rid of all constitutional and local symptoms, and their health may be restored for years, but, he adds, "that such individuals eventually sink under the disease is true."[3] Dr. Edward Smith, in an essay on "The Curable Stage of Phthisis," (which is that hypothetical "pretubercular" stage already noticed in this article,) declares that while a cure, properly so called, may occur after the deposit of tubercle, it really does so in but an infinitely small number of cases, and in *none* are we able to predict so favourable an issue.[4] It is well known that Dr. Bennett has enthusiastically maintained the curability of phthisis, and that nature herself accomplishes the cure in "a vast number of cases." When he adds that she has done this in its incipient stage—*i. e.* by calcification of tubercle—he states what facts hardly warrant, except in the cases of persons past middle life in whom the disease, if such it can be called, is latent. He refers to six cases in the advanced stage of the disease in which the arrestment of the disease is ascribed by him to art,[5] and particularly to cod-liver oil; yet he admits that any thing which will rouse the nutritive functions may produce the same effect. So Dr. Flint finds that in eight out of twenty-four cases of arrest of tuberculosis the cure "was evidently due to an intrinsic tendency to that result,"[6] and that in the rest it depended upon a complete change of habits, from sedentary and indoor pursuits to active and even violent exercise in the open air. Upon the question before us no man living can speak with greater authority than Dr. Walshe, and he gives no flattering prospect to the victims of consumption. He ignores entirely that limbo of a "pretubercular stage" in which the patient is not sound enough for health, nor diseased enough to be called tuberculous; he describes what Laennec and Louis so distinctly mention, that in phthisis the patient may go through successive attacks resulting from the maturing of successive crops of tubercles; and concludes that in a very small proportion, *so small that it may be ignored*,[7] an actual recovery takes place. Elsewhere (p. 387) he estimates the proportion of those in whom a complete restoration of function and the disappearance of active pulmonary disease takes place at four and a quarter per cent. In the excellent essay of Dr. C. Radclyffe Hall[8] the doctrine which we consider to be the true one upon this subject is stated in the following words:—

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[1] Phthisiologia, p. 123.

[2] Œuvres, iii. 59.

[3] Archives Gén., 3ème ser. v. 191, 289, 460.

[4] Path. Anat., 3tte Aufl., i. 308.

"Of the absolute frequency with which such healing of a cavity takes place, we have no positive knowledge; probably it is not extremely rare; but of the infrequency with which it *so* takes place that the patient eventually recovers from his phthisis, we have sadly too established a conviction. The possibility of such a cure is quite certain; but that we have a right to anticipate it in any case of undoubted tuberculous cavity in the lung, all experience forbids."

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[1] Diseases of the Chest, 1837, pp. 442 and 447.

[2] Bull. de Thérap., xxxiv. 16.

[3] Lancet, Aug. 1856, p. 187.

[4] Edinb. Med. Journ., ii. 689.

[5] Tuberculosis, p. 112.

[6] Am. Journ. of Med. Sci., Jan. 1858, p. 78.

[7] Am. ed., 1860, p. 377.

[8] Brit. and For. Med. Chir. Rev., xvii. 468.

We might multiply these citations from authors whose conclusions have the weight of laws in pathological science, and especially from among the great teachers of German medicine, but these will perhaps satisfy the reader that the sanguine expressions of faith in the power of medical art to cure phthisis are misplaced and premature, and that we should expose ourselves to less chagrin and our patients to less sorrow by admitting the unquestionable truth that in any given case of phthisis there is not one chance in a hundred of death being averted even for a few years. Not to recognize this probability, while we employ every means in our power to render each particular patient the fortunate exception to the law of mortality which weighs upon those affected with pulmonary tubercles, would be to close our eyes against the most evident conclusions of experience, and forswear our duty to those whom we are bound to serve. We should rather present to them the danger in its full proportion, and make its very magnitude a motive for them literally to *work* out their salvation from the fate which hangs over them.

The prognosis of acute phthisis would seem, contrary to what has generally been supposed, to be less unfavourable than that of the chronic form. Lebert claims to have seen not less than six examples of its cure. Four of these patients afterwards died of other diseases, and exhibited in their lungs the clearest evidences of cured miliary tuberculosis.[1] Several have also been published by Wunderlich.[2] The difficulty of diagnosis in this disease must throw a shade of doubt upon the nature of some of the reported cases, but the proof in those of Lebert is complete. A. S.

ART. XI.—*Sanitary Science.*

1. *Proceedings and Debates of the Fourth National Quarantine and Sanitary Convention, held in the city of Boston, June* 14, 15, *and* 16, 1860. Reported for the City Council of Boston. Geo. C. Rand and Avery, City Printers. Boston, 1860.
2. *Public Health. The Right Use of Records founded on Local Facts;* being two papers read before the National Association for the Promotion of Social Science, at Bradford, in October, 1859; with an account of subsequent proceedings. By HENRY WYLDBORE RUMSEY, Author of "Health and Sickness of Town Populations," "Essays on State Medicine," &c. London, 1860.

WHATEVER may have been the doubts of a few in anticipation of the meeting of the first Quarantine and Sanitary Convention of the United States, in 1857, there can be no question at the present date that it and those which have succeeded it have been productive of useful and important results. The difficulties attendant upon the inauguration of such an effort have been, to a great extent, met by the earnestness and practical ability of those by whom it has been carried forward.

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[1] Handbuch d. prakt. Med., ii. 115.

[2] Archiv d. Heilkunde, i. 289.

We have been, in this country, behind the nations of Europe, less in appreciation of the principles of public hygiene than in the administrative reforms which they should develop, and in the generality of interest of intelligent men in their advancement.

The Quarantine Regulations of the United States have been, to this time, nearly identical with those imposed in the Colonial times; while they have been undergoing modification in Europe for more than thirty years.

All educated men in England, France, and Germany, now find in sanitary science favourite topics of inquiry and reflection; while many of the important legislative provisions of the states of central Europe, for the protection and preservation of the public health, are rather of Italian than Teutonic origin. At Rome, under the emperors Valentinian and Valens, "the poorest of the people shared with the household of Cæsar the services of an honourable Iatrarchy;" and traces of the perpetuation of the Roman Medical Code are yet extant in Belgium. Farther back, we may remember that Hippocrates and Democedes held a medico-sanitary relation to the public, at Athens, Ægina, and Samos. In Plato's ideal republic, the physician had an essential place.

In modern times, the earliest systematic treatise upon the subject of "Medicinische Polizei" or Medical Polity, appears to have been that of Johann Peter Frank, in 1779.[1] Since that time Germany has furnished a number of able writers upon its different themes. In England, after the "twelve proposals" of John Bellers (1714), sanitary literature maintained a fragmentary state until a quite recent period; while the action of government upon questions of public health has been designated by an English writer as "little dabs of doctoring done by different departments."

As we have said, however, this is no longer the case anywhere in Western Europe, or in this country. While many questions both of principle and administration remain undecided, and while it may be true that "only the threshold of sanitary science has yet been reached," yet a great beginning of reform consists in the fact that preventive medicine is now *appreciated* as a necessary branch of social and political economy; and that it has attained already important triumphs, both in lessening the intensity and prevalence of destructive diseases, and in mitigating or removing the burdens and inconveniences, personal and commercial, which ignorance and terror had long imposed.

The share the American Quarantine and Sanitary Convention has taken in promoting these improvements, by giving the authority and influence of its sanction to principles before advocated by individuals alone, may be readily gathered from the present volume of its debates and proceedings. Believing, however, that its conclusions and enactments of previous years must be familiar to most of the readers of this Journal, it is necessary only to allude at this time to the confirmation which they have again received, and to the efforts made to extend and apply them.

Upon the subject which was most prominent in the labours of previous conventions, the following resolution was passed by that of 1860, on motion of Dr. Jewell:—

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[1] John Evvich, the *Medicus Ordinarius* of Bremen, published in 1582 a singular book entitled *De officio fidelis et prudentis Magistratûs in tempore Pestilentiæ*. Rumsey, *Essays on State Medicine*, p. 300.

> "*Whereas*, at the last meeting of the Convention, after a learned and dispassionate discussion, the long agitated question of the non-transmission of yellow fever from one person to another was definitely settled; in order to strengthen that decision, therefore
>
> "*Resolved*, that the action of the last Convention on the question of the non-contagiousness of yellow fever be, and is hereby reaffirmed."

During the debates of the same session, and in the less formal speeches made by delegates on incidental occasions, confidence in the soundness of the views previously agreed upon was most freely and even enthusiastically expressed. Yet that these views are not extreme, is obvious from the character of the report of the Committee on External Hygiene, adopted almost without dissent by the Convention.

This report is probably the most important part of the Transactions of the year. It was prepared by Drs. A. N. Bell, E. Harris, W. Jewell, R. D. Arnold, and H. G. Clark; including also a report on the "Utility of Wet Docks in connection with Quarantine," by Drs. J. W. Sterling, A. H. Stevens, and J. McNulty.

Opening with a few prefatory remarks, a sketch is given, in the report, of the progress of the quarantine discussion and its relation to sanitary reform, since the time of Chervin; awarding due credit to the French reformers, Dupeytron, Aubert-Roche, and Mélier, as well as to Chadwick, Guy, Southwood Smith, Duncan, Milroy, and others in Great Britain.

The Committee then makes a statement of the special wants and faults of existing arrangements for "external sanitary defence;" under the two heads, I. The defects that relate to the sick and to sanitary protection; II. The deficiencies that relate to commercial transactions and public convenience. Under the first head are included hospital accommodations and facilities for the reception of patients, as well as the construction and management of docks and warehouses for quarantine purposes. Under the second head are mentioned the needless and expensive detention and delay of vessels and cargoes, the damage to such cargoes and vessels at quarantine, and the inconvenience and expense of lighterage.

Several of these topics are emphatically dealt with in the report upon the Utility of Wet Docks in connection with Quarantine.

Experience in the New York Marine Hospital has afforded reasonable ground for dissatisfaction with the facilities there and in similar establishments, afforded for the care of the sick. In sixty years 72,595 patients have been admitted into that hospital, of whom 10,493, a seventh part, have died.

> "In order fully to appreciate the wants of a quarantine establishment, it is necessary to have been a spectator of some of its woes. In reading the history of quarantines as they have existed in various parts of the world, as well as legislative and other reports and communications relating thereunto, the paramount and almost exclusive subjects of inquiry have been, How shall we protect our citizens against the invasion of pestilential disease? How can we lighten the burdens which quarantine imposes upon commerce? The speeding of the weary voyager and the care of the sick being regarded as of minor importance, too often is the poor squalid immigrant, as he is frequently called, shunned, loathed, and, if sick, even viewed as a culprit. We are not apt to appreciate their miseries, destitute, homeless as they are; fleeing from famine and oppression abroad; long pent-up in the hold of an ill-ventilated vessel; their sickness their misfortune, not their fault."

The description of the Lazaretto San Leopoldo at Leghorn suggested to the writer of the report the advantage of wet docks in alleviating the sufferings of the sick on being landed at quarantine. At the same time, such docks would afford protection to the vessels themselves against the violence of storms, would secure their merchandise from plunder and loss, and would expedite the introduction of goods into the market. Having first landed passengers and cargoes, vessels needing purification may be cleansed and ventilated at the dock; although very foul vessels will require the further use of *dry docks* for thorough expurgation.

Commercial history has shown that, as at Liverpool and London, the construction of wet docks has done much to attract and facilitate commerce. The West India docks on the Thames comprise an area of two hundred and ninety-five acres.

Very much less extensive accommodation, however, would be needed at any port for the purposes of quarantine. It is estimated by the Committee that a dock capable of affording room for thirty or forty vessels at a time would suffice as a maximum.

The next section of the report of the Committee on External Hygiene is upon "Specific Measures of Quarantine, severally applicable to Yellow Fever, Cholera, Typhus, and Smallpox, with the variations which different localities require."

Quarantine Hospitals are first considered. As to the distribution of the sick, the following remarks indicate the views of the Committee:—

> "While facts do not warrant the conclusion that any disease is necessarily and inevitably infectious or contagious under all circumstances, it is so true of smallpox and of typhus that they do certainly spread by personal contact, limited infection of apartments, and also by personal *fomites*, that it is manifestly the duty of the sanitary authority to insure the entire seclusion of each of those maladies. As regards both yellow fever and cholera, it will be generally admitted that it is due to public quietude, even if it is not known to be absolutely necessary for public safety, that persons arriving at quarantine with either of those maladies should be provided for in secluded hospitals. But it is safe to recommend that the local sanitary authority of any city or port should decide whether special hospitals be established exclusively for the sick arriving at quarantine, or whether the special hospitals established for the seclusion of the same diseases occurring in such city or port, be also used for the same class of patients arriving from abroad."

This is going as far in the direction of reform as can be expected at the present time. As it was observed by a speaker in one of the debates of the Convention, "civil authorities will never move in advance of public sentiment, and public sentiment will never progress until it is enlightened." And thus, while a few scientific minds in this country, and many abroad, still advocate, with an earnestness of conviction that no preponderance of evidence can shake, the contagiousness of both cholera and yellow fever, it is perhaps, so far as public arrangements are concerned, "wiser to acquiesce, at least provisionally, in opinions" or practices "which have prescription in their favour; and of which the refutation, if they be refutable, is not yet certain and complete."[1] Yet, we are confident that more than this will hereafter be done; and that some future sanitary convention, at a time not very far distant, will insist that no more fear should be felt, by a community, of the persons of patients sick with yellow fever, or cholera, than is now felt of those suffering with pneumonia or influenza.

As to location, it is urged that quarantine hospitals should be so convenient of access from the quarantine anchorage, and warehouses, and docks, as to afford the best possible facilities for the immediate medical care of the sick arriving, and of labourers or others becoming ill at the station.

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[1] Lord Stanley's Address on Public Health. Birmingham, 1857.

In regard to arrangements, such hospitals require, especially, 1. *Ample air-space and effectual ventilation.* 2. Proper supply and control of sunlight in the wards. 3. Such construction and material for the wards as not to favour the retention and perpetuation of febrile poisons and pestilent emanations. 4. Means for *immediate* and safe disinfection of all clothing, bedding, &c.

The Committee recommends that the quarantine docks, warehouses, and anchorage, should be located at least two miles from any populous neighbourhood, however rural, and, when practicable, at a much greater distance from cities or large towns. The executive management of such establishments should be under direction of competent scientific officers.

It is very properly observed that a ship arriving with typhus fever or smallpox at midwinter, is as legitimately a subject for quarantine restrictions as one with yellow fever on board in midsummer.

So important are the declarations of the Code of Marine Hygiene presented in this report, as to make it appropriate to quote some of them in full.

"Every organized government has the right of protecting itself against the introduction of infectious diseases, and of putting any country, place, or thing in quarantine which would introduce infectious diseases; provided, however, that no sanitary measure shall go so far as to exclude or drive from port a vessel, whatever may be her condition.

"2. The only diseases at present known against the introduction of which general quarantine regulations should be enforced, are, plague, yellow fever, cholera, smallpox, and typhus fever. As regards plague, the European Congress at Paris had the right to settle the question for the nations there represented; and, inasmuch as they and the other nations of the Eastern Continent have reason to subject the plague to quarantine restrictions, the States of America yield implicit obedience to that convention.

"3. All quarantine regulations, of any place whatever, should bear with equal force against the toleration or propagation of disease as against its introduction; and authority to prevent the introduction of disease in any place, should be equally applicable against its exportation.

"4. All quarantinable diseases are chiefly introduced and propagated by the *matériel* of commerce; and it is therefore against it that quarantine restrictions should be instituted, and *not* against the *personnel;* excepting, however, persons with no evidence of vaccination, and known to have been exposed to smallpox; such persons shall be vaccinated as soon as possible, and detained until the vaccination shall have taken effect; otherwise, they may be detained fourteen days from the time of the known exposure.

"5. The application of quarantine regulations shall be regulated by the official declaration of the constituted sanitary authority at the port of departure where the malady exists. The cessation of these measures shall be determined by a like declaration that the malady has ceased, after, however, the expiration of a fixed delay of thirty days for the plague, fifteen days for yellow fever, and ten days for cholera.

"6. It is obligatory on all vessels to have a *Bill of Health;* this shall consist of two kinds only, a *clean bill* and a *gross bill,* the first for the attested absence of disease, and the second for the attested presence of disease. The bill shall state the hygienic state of the vessel; and a vessel in a bad condition, even with a clean bill of health, shall be regarded as a vessel having a gross bill, and shall be submitted to the same régime."

Provisions in detail are also elaborately set forth: as, I. Measures relating to Departure. II. Sanitary Measures during the Voyage. III. Sanitary Measures on Arrival.

Under the last head we find the repetition of the principle that *all well persons* shall be allowed free *pratique*, excepting in cases of smallpox, as above stated. Ordinary cargoes of dry and imperishable goods are also admitted to free *pratique* after examination, with some temporary exceptions.

Merchandise to be submitted to obligatory quarantine and purification, comprises clothing, bedding, personal baggage and dunnage, rags, paper, paper-rags, hides, skins, feathers, hair, and all other remains of animals, woollens, and silks.

Cotton, linen, hemp, and *cattle* are to be subject to *optional* quarantine. All other merchandise is to be *exempt* from quarantine. A foul ship, it is well said, is much more to be dreaded, as a vehicle of introducing disease, than anything she has on board. Such ships must be broken out and duly cleansed and ventilated before they can be properly allowed to enter a port or lie alongside of a wharf or other ships.

The Committee furnishing this report was, on its adoption, directed to negotiate with the national government or department of State, to secure the national and international adoption of a code based upon the principles advanced in it. A committee of delegates from the several States represented in the convention was also authorized to confer with the State governments in regard to its adoption.

Dr. D. B. Reid, of Wisconsin, a member of the same Committee, contributed an interesting "Summary," on the importance of an International System of Quarantine, which is appended to the report.

The remaining reports published in this volume are upon "Registration," "Heat as a Disinfectant," "Civic Cleanliness, &c.," and "Legal Control of Poisons and Dangerous Drugs." A few words only of remark being allowed us upon each of these, the first named will be taken up in connection with the papers upon a similar subject, by H. W. Rumsey, named at the head of this article.

Dr. Elisha Harris' paper upon the "Utility and Application of Heat as a Disinfectant" is a very interesting and instructive one. After a brief historical allusion to the ancient and modern use of *fire*[1] for the destruction of infection, and an account of the great difficulty and costliness which must make its employment unavailable on a large scale, he considers, at some length, the evidences of the disinfecting power of high temperatures short of a degree which would be destructive of ordinary textile fabrics and other materials likely to act as *fomites*.

M. Violette has shown that dry vegetable tissues enter upon the first stage of carbonization at 222° Fahr. Ovens bake at from 320° to 400°; sulphur ignites at 560°; cane-sugar melts at 320°; and liquid albumen coagulates at about 145°. All vegetable life is extinguished at a temperature far below that of boiling water; and animal life is generally destroyed by a comparatively brief application of heat that coagulates albumen. All kinds of fermentative catalysis cease at a temperature still lower. All processes in nature, in short, which bear any analogy to the incubation, propagation, and action of pestilent infections, are arrested or very essentially modified by high heat.

Observation and experiment have confirmed the expectation thus derived, so far as they have gone. It is a commonly known fact, that the *boiling* or *steaming* of infected clothing effectually purifies it, while mere washing is entirely insufficient.

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[1] See La Roche on Yellow Fever, vol. ii. chap. xxii.

In Berlin, in 1851, Dr. Von Busch succeeded in disinfecting the wards of the lying-in hospital, by a dry heat of 150° Fahr., maintained for two days; although puerperal fever had before obstinately clung to the house, in spite of all other measures of thorough cleansing. The same class of patients was immediately readmitted, without any occurrence of the disease. A year later, the pestilence returned, and was again annihilated in the same way, by the agency of common stoves.

It is certainly rational to extend the expectation of similar results to the cases of hospital gangrene, erysipelas, and typhus, which so often cling to public and even private buildings, and, in the instance of the last disease, to ships. As to yellow fever, facts of positive value are given, as having occurred in the experience of Dr. Harris in the New York Quarantine Hospitals, and in that of Dr. A. N. Bell in the U. S. Navy, in southern waters. Reference is also made to the instance of the British transport ship *Regalia*, narrated by Dr. William Ferguson.[1] For the details of these cases, we must refer the reader to the report itself.

Some very interesting experiments were made upon this subject by Dr. W. Henry, F. R. S., of Manchester. His purpose was to determine, 1st. What elevation of temperature cotton and other substances likely to harbour contagion might sustain without injury. 2d. That, in at least one unequivocal instance, contagious or infectious matter should be proved to be destructible at that temperature. As quoted by Dr. Harris, he ascertained that raw and manufactured cotton, silk and wool, fur and feathers, could be exposed for three hours to a dry heat of from 180° to 220° without injury.

Vaccine virus was also found to lose its specific property after exposure to a heat of 140° or upwards. Further experiments with the clothing, &c. of patients having typhus and scarlatina, strengthened, although, of course, less definitely, the evidence in favour of the proposition that a temperature of 200° will destroy infection or contagion, without injury to the fabrics most likely to be its vehicle.

Dr. Harris announces his full belief in this potency of heat, whether dry or applied by steam. He urges, however, that more extended experiments should be made upon various points connected with its use. For vessels, especially, *steam* will be found much the most convenient medium. No costly apparatus will be required; steam-tugs upon the water, and portable steam-generators upon land can be made to serve the purpose at moderate expense.

As illustrating the absence of injurious action by high steam heat upon valuable fabrics, it is stated that, at the establishment of J. G. Scott, Esq., at Shemlan, near Mt. Lebanon, in Syria, vast quantities of silk cocoons are exposed to jets of steam, to destroy the vitality of the chrysalis, and thus preserve them in a state fit for reeling. This is effected in a few minutes, without any damage to the silk.[2]

We cannot avoid entertaining a sanguine hope that the investigations of Dr. Harris upon this subject may be pursued with such further success, upon a large scale, as to establish the importance of high heat, as being, with the exception of intense cold, the *only* reliable disinfectant, in the case not only of yellow fever, but of all analogous diseases.

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[1] Royal Med.-Chirurg. Transactions, vol. viii.

[2] Prof. Bollman, of Russia, has found the *potato-disease* to be arrested, by drying the potatoes used for seed under a moderate heat; their germinating powers not being thus at all interfered with.

The report of Lieut. Egbert L. Viele, on "Civic Cleanliness, and the Economical Disposition of the Refuse of Cities," is deserving of a more extended analysis than our space will permit. It considers, succinctly, the four subjects of drainage, paving, supply of water, and sewerage, with practical suggestions upon each.

In regard to drainage, local conditions must necessarily govern the arrangements required for each place. The cities of this country, having been built with reference chiefly to the convenience of trade, and having many of them grown with enormous rapidity, are much behind those of Europe in facilities for drainage.

Paving is held by the author of the report to be of equal importance to the public health. The best pavement is asserted to consist of "small cubical blocks of primitive rock laid upon a bed of concrete." The old Roman pavements, which have survived everything around and above them, were constructed upon this principle. Cobble-stone paving is a mere temporary expedient.

Rome affords also a salutary lesson (as was shown by Dr. John Bell in his report of 1859) as to the value of an ample water-supply, as well as of sewerage. "To her sanitary regulations she owed her imperial splendour; to their neglect she owed her ruin."

The report of Lieut. Viele also alludes to the causes of insalubrity connected with docks, wharves, piers, and bulkheads, as ordinarily constructed. A diagram is given, showing a plan for a wharf built on stone piers, the superstructure being of wood.

Upon the topic of the "Economical Disposition of the Refuse Matter of Cities," Liebig's letter to Alderman Mechi, of London, is introduced, as affording a correct exposition of important principles. We have room only for a few sentences :—

> "A well, however deep it may be, which receives no supply of water, must, in the end, become empty, if its water is constantly pumped out. Our fields are like such a well. For centuries those elements which are indispensable to the reproduction of the crops have been taken from the soil in those crops, and that, too, without being restored. The loss of these elements is brought about by 'the sewerage system of towns.'"
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> "History teaches that not one of all those countries which have produced corn for other lands have remained corn-markets, and England has contributed her full share towards rendering unproductive the best lands of the United States, which have supplied her with corn, precisely as old Rome robbed Sardinia, Sicily, and the rich lands of the African coast, of their fertility."
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> "If it be perceived that no country can perpetually supply another with corn, then it must be still easier to understand that an importation of manures from another country must cease still earlier." "The prices of bones have already become so high in Germany as to forbid their exportation. . . . . In relation to guano, I have been assured that in twenty to twenty-five years, if the use of guano should increase in even the same proportion as hitherto, there will not remain in South America enough to freight a ship."
>
> "It has been maintained that the recovery of the manure-elements out of the sewers of large cities is impracticable. I am not ignorant of the difficulties which stand in its way. They are indeed very great; but if the engineers would come to an understanding with the men of science in relation to the two purposes —the removal of the contents of the sewers, and the recovery of their valuable elements for agriculture—I do not doubt that a good result would follow."

The remainder of Lieut. Viele's report is occupied by the brief discussion of the best modes of disposal of city-refuse, under the several heads of street-cleanings, garbage, sewage, night-soil, and offal. It is apparent that no perfectly economical scheme has yet been devised; and although we are hardly ready to indorse the criticism of a member of the Convention, in the debate upon the adoption of the report, as to its having touched the matter "too lightly," yet we may hope that this is a subject to which the most practical minds will yet be devoted, until we obtain hereafter a remedy both for the sanitary evil and the economical extravagance.

In Paris, the contractors who carry off the sweepings of the streets alone, realize upon the sale in the form of manure a total sum of $700,000 per annum. The elevated site of Edinburgh allows its sewage to be distributed over a considerable tract of meadows, producing unexampled crops of grass, and commanding a high rent. In Birmingham, a new system of drainage and sewerage was commenced in 1840, by which, through the agency of a reservoir, three miles from the centre of the town, and capable of holding six million gallons, the sewage may be made available. This reservoir will command the Tame and Trent Valleys, one hundred miles in length, with a fall of upwards of four hundred feet.

The Chinese and Japanese seem to have been in advance of western civilization in the use of *night-soil* as manure or *poudrette.* It is employed largely, however, already, in Belgium and France.

Dr. C. B. Guthrie's report "On the Legal Control of Poisons," is the last in the volume now before us. Its purpose is to urge such legislation as will lessen the danger connected with the sale of dangerous drugs by imperfectly educated or irresponsible persons; and also to make such restrictions uniform in the several States.

There appears to have been, in the debate in the Convention upon this report, considerable difference of opinion; not as to the desirableness of these objects, but as to the means of promoting them. Several members objected to the specification of a list of poisons; which was, accordingly, left out. We may observe, however, that Dr. Guthrie's argument in its favour seems to be supported by the fact that, as stated by Dr. A. B. Taylor before a committee of the House of Lords, of 540 deaths yearly, on an average, by poison, in England, three-fourths have been due to two substances, arsenic and opium—while a list of thirteen articles includes nearly every case that is recorded.

It was a question with some members of the Convention, apart from all doubt as to the practicability of more than merely palliative legislative reform, in this matter—whether it was an appropriate subject for the consideration and action of a sanitary body? The same question was more positively urged in regard to the epidemic "pleuro-pneumonia" of cattle, upon which some remarks were made; and it might have been extended, for analogous reasons, against the appointment of a committee upon the working hours of the labouring class.

We cannot hesitate to agree with those who answered this question, in all of these cases, in the affirmative. All such subjects of investigation, action, and legislation, are relevant to public hygiene and preventive medicine; all are therefore appropriate to a sanitary convention.

The disposition of the members to extend the field of labour beyond the anticipation of those who were the pioneers of the work, was shown by the appointment of a Committee on State Medicine. It is true that the duties of this Committee were not so enunciated as to justify the title given to it; it being really a standing Business committee. But, such action indicated a consciousness among the members that room existed for some modification at least in the classification of their labours and inquiries;

especially when, as will soon be the case, it shall have assumed the proportions of a perennial association, instead of an annual convention.

What is State Medicine? Dr. Ordronaux, who introduced the subject, defined it as "the application of the principles of medical science to the administration of justice and the preservation of the public health; a system of medical police, preventive, punitive, and reformative." Mr. Everett used for it the synonyme "State *Hygiene*." Dr. E. Harris, referring to the German term, *Medicinal Polizei*, designated it as "the work of the State in reference to questions of sanitary science." This is confirmed by the language used in the only systematic English work on the subject. H. W. Rumsey, in his "Essays on State Medicine,"[1] speaks of their theme as "the Agenda of a State with regard to the public health."

It may not be out of place to quote briefly the schedule of topics deemed by this able writer to be appropriate to State Medicine. These are:—

> "I. Subjects concerning which the State should direct *Investigation:* A. Statistical; B. Topographical; C. Jurisprudential.
>
> "II. *Practical arrangements* for the personal safety and health of the people, requiring for their enforcement either direct or legislative enactments, or local institutions and regulations: A. Preventive; B. Palliative measures.
>
> "III. *Organized machinery*, established by law, for carrying into effect the aforesaid inquiries, for deliberation and advice on special arrangements and emergencies, and for the administration of existing laws. This would comprehend, A. The education of medical men, and the qualification of other technical, scientific and administrative agents. B. The institution of official authorities—Boards and Offices—for central and local superintendence and action."

Obviously, a distinction may thus be properly maintained between, upon the one hand, the *Science* of etiology, and the *Theory* of public hygiene —and, on the other, *State agenda* for the legislative and administrative *application* of such theory and science to the protection and amelioration of the public health.

But, we must leave this topic, to dwell for a short time upon the report to the Sanitary Convention, by Dr. E. M. Snow, of Providence, on Registration.

Dr. Snow, in clear and concise language, states, I. The kind and extent of information desired for statistical and sanitary purposes; and, II. The best method of obtaining the information needed, in relation to births, marriages and deaths, particularly in cities.

Upon the first head, we have room to quote only the following paragraphs:—

> "Information in relation to the *parentage* of those who die is important, not only because the facts obtained relate to two classes of the population which, as classes, are entirely different from each other in their sanitary condition and in all the circumstances by which they are surrounded; but also because the division of the population according to nativity or birth-place has no value whatever, and only misleads and deceives the inquirer after truth. And yet the classification according to birth-place alone is given in the mortuary reports of all the cities of this country except Boston and Providence.
>
> "The following examples will show the value of this distinction. In the city of Providence, during the year 1859, there were 340 deaths of children under 5 years of age. According to nativity, we find that 338 of these children were of American, and 2 only of foreign birth. But, classified according to parentage, 137 were of American, and 203 of foreign parentage.
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> "In the same city, during the same year, there were 75 deaths from the four

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[1] London, 1856.

diseases, cholera infantum, cholera morbus, diarrhœa and dysentery. Of these 75 persons, 69 were of American and 6 of foreign birth; but according to parentage, 25 were of American and 50 of foreign parentage."

In relation to the registration of *births*, the two plans, of requiring *parents* to report them, and of demanding the same duty of *physicians* have proved practically inoperative. Dr. Snow believes the only available method to be, that of requiring the recording officer to obtain the information personally, or by his agents. This is done in Boston and Providence, with good results. In Providence, marshals are employed to visit every family in the city, in January and July of each year, and obtain all necessary information in regard to all children born during the preceding six months. A fee of ten cents for each full report of a birth, and another fee of the same for recording it, are provided.

As to *marriages*, a plan similar to that contained in the *Code Civil* of France is recommended. According to this, a formal marriage contract must be written, signed, and sealed, acknowledged before a proper officer, and placed on record. The certificate to this effect of the recording officer can alone authorize the completion of a marriage by a religious ceremony.

Equally imperative reasons are urged in this report in favour of an analogous provision for the registration of *deaths*. It is advised that,

"1. No dead body of a human being shall be buried, or placed in a tomb, or removed from the city, without a permit from the recording officer.

"2. No permit shall be given until full information concerning the deceased person is furnished, including satisfactory evidence in relation to the cause of death.

"For the latter purpose, 'well qualified physicians should be appointed in all cities, whose duty it should be to make an examination into the circumstances relating to all deaths reported without the certificate of a physician or of a coroner.'"

If we turn now to Mr. Rumsey's papers on the "Right Use of Records founded on Local Facts," it will appear that similar difficulties to those which impede the collection of sanitary statistics with us, are also obstructive in England. Dr. Farr asserted recently that "only 83 in 100 of deaths throughout the kingdom are certified by medical attendants; and that in one quarter of a year nearly twenty-two thousand deaths were returned without any authorized statement of the cause."

In France, the law for registration of births, deaths, and marriages is precise. The *médecins vérificateurs* of Paris are required to attest, after examination, the fact of death, its cause, and other particulars. In Prussia and the Southern German States, accuracy in the returns is not secured to any great extent.

The Austrian system of mortuary registration is the most perfect. Every death must be examined into by the *Todtenbeschauer*, who is a surgeon. His certificate, founded on personal inspection and inquiry, is necessary to burial. All sudden, violent, or suspicious deaths, still-births in certain cases, and deaths under the treatment of quacks, are referred to a court of official physicians and surgeons.—*Gerichtliche Leichenbeschau.*

The two papers to which we have just referred were contributed, as stated upon their title-page, by Mr. Rumsey, to the meeting of the National Association for the Promotion of Social Science, at Bradford, England. This Association, organized in 1857, in which year its first meeting was held at Birmingham, under the Presidency of Lord Brougham, contains among its members a large number of the most eminent men in Great Britain. The

Department of Public Health has been especially favoured in this respect; the medical profession being largely represented among its members and committees.

Mr. Rumsey's object appears to be the laudable one of promoting sanitary reform by instituting more reliable methods for accumulating such *facts* as are required for the establishment of its principles; by "the adoption of a more rational, trustworthy, and efficient system of public inquiry and record than has yet been applied to the *sickness* and *mortality* of the population." Only thus can the true laws of etiological science be ascertained.

> "If complete records of sickness and mortality were compiled and published, in the several registration districts, by a legally constituted order of men, of superior education and large medical experience, habituated to scientific processes, and in respectable position, any deliberate concealment or perversion of facts would be next to impossible. . . . . . Granting fully that it would be most unreasonable to look for perfect reports under any general system, yet, to oppose measures clearly tending to secure a minimum of error, because, in the nature of things, abstract truth is unattainable, I consider a culpable absurdity."

John Bellers, at the beginning of the eighteenth century, Dr. Clifton, in 1732, and Dr. Walker, of Huddersfield, in 1844, urged strongly a system of public registration of disease. Liddle, Milroy, and others, have followed with similar plans. Amongst those, who, in England, have recently taken active interest in the subject, have been Miss Louisa Twining, whose paper was presented to the Social Science Association in 1860, and Florence Nightingale, who made some valuable suggestions upon it to the Statistical Congress.

The difference of opinion between Dr. Milroy and Mr. Rumsey as to the registration of sickness being placed under control of the Poor Law Board, to which the latter objects, does not immediately concern us; although experience in this country also would probably sustain the view that "pauper controlling authorities" are, by the very nature of their charge, unfitted for wider spheres either of sanitary investigation or medical relief.

Yet, commencing with cases under care of Guardians of the Poor, statistics of dispensaries and hospitals might follow as well as those of prisons and penitentiaries; asylums of different kinds; dock-yards, arsenals, and other public works; revenue departments and police force; mines, collieries, factories, and public schools. Friendly or beneficial societies have furnished a great deal of material, already, to vital statisticians. Lastly, it only requires uniformity of record, and a public supply of tabular forms, as in the instance of the medical records of the army, to enable private practitioners to furnish full accounts of the statistics of disease and mortality occurring in the community at large. It is very much to be desired that such accurate and regular statements might take the place of the annual "Reports on Epidemics" of our county, State, and national associations; which have been in this country, as they are said by Mr. Rumsey to have been in England, with few exceptions, "incomplete, unsystematic, and temporary." Such reports are mere apologies for the statistics which ought to be obtained for sanitary purposes, were the minds of medical men fully awake to their importance, and to the facility with which they might be recorded and collated.

Many errors in sanitary, and even in medical, theory, might thus receive correction. Mr. Rumsey quotes, for example, the very diverse views of the late Dr. Snow, Dr. W. Budd, and others, upon the extension of cholera;

of Drs. Murchison, Barker, and McWilliam, and of Dr. Parkin and Mr. Craig, of Ayr, upon the origin of typhus and typhoid fever; to show that observers of the same facts may reach the most opposite conclusions, so long as those facts are not so exactly rendered as to allow of close scientific analysis.

Again, two of the etiological propositions which have, from the high character of their advocates, as well as from their own practical bearing, attracted of late the most attention, are Dr. Farr's law of *altitude*, i. e., that the amount of disease and mortality varies inversely with elevation above the sea level; and Dr. Baly's law, that disease varies in proportion to the *density* of population. Now, both of these "laws" have been very firmly established by facts in regard to cholera, *so far as cholera is concerned.* But, we venture to affirm that it requires a much larger induction than has yet been made possible, to include all diseases under the same statements; especially as there is a very simple view of the etiology of cholera, according to which it would not be legitimate to extend any conclusion based upon the history of its propagation, farther than to typhus, and to the probable *mortality* of all severe zymotic diseases.

Sanitarians have begun to see that, however numerous are the evidences of the destructive influence of *filth* in its various forms, yet it is a fallacy to imagine it the sole cause of preventable disease; or that "public cleansing and the care of the public health are convertible terms." Food, drink, climate, occupation, privation, migration, ethnological characters, must all be considered. Dr. E. Headlam Greenhow truly asserts that "from looking too exclusively to certain obvious causes of mischief affecting the public health, the benefits realized from sanitary exertions have often failed to fulfil the hopes of their promoters or the expectations of the public."

Still further, Neison, the distinguished statistician, was able to show, from materials derived from the "Friendly Societies," that the highest ratio of sickness is sometimes found associated with a favourable rate of mortality. Mr. Rumsey goes farther, and asserts a belief that "*a diminution in the rate of mortality will be found to co-exist generally with an augmentation of the rate of sickness.*"

> "The real sanitary condition of a population is most correctly determined by summing up the periods during which persons of every age and sort suffer from disease, injury, or infirmity. The total 'sick time' measures the *amount* of disease. Medical records display its *nature* and causes. The number of deaths, according to sex and age, determines its *intensity*. Upon these stand-points every statistical inquiry respecting life and health ought to rest."
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> "Now, as a necessary result of improvements in domestic management and medical treatment, and owing to the removal of those more virulent agents of destruction which, by sharp and decisive strokes, prematurely sever the thread of life, its duration has been lengthened in our great cities. But, at the same time, the sickly and infirm period of existence has been prolonged probably in a greater degree than even life itself. Chronic diseases, or at least functional disorders have increased. Vital force is lowered. Man's work is arrested; his duties are unperformed; his purposes fail; though he still lives. Weakly, diseased children are now mercifully helped, as they never were in olden time, to grow up into weakly, ailing adults, who, in their turn, propagate with abnormal fecundity an unsound progeny. Is this true sanitary progress? Does it deserve the ostentatious parade of a decreasing death-rate?"

Disheartening indeed would be the prospect to the well-wisher of mankind, if this were the best result attainable in the application of the principles of private and public hygiene. There is a better side to the picture; but still, it is highly important to take heed to the facts *as they are*, lest we should overlook means of improvement quite as necessary as any that have yet been discerned.

We are compelled to forego the consideration of Mr. Rumsey's second paper, on "Certain Departments of Medico-Sanitary Police and Medico-Legal Inquiry;" in which he conveys a plan for the establishment of four sanitary offices, statistical, supervisory, analytical, and medico-legal. His statement, however, therein, of the proper sphere and *animus* of the *sanitary reformer*, may form an appropriate conclusion to these remarks:—

> "His motto is 'Progress.' His means: impartial, scientific, and comprehensive inquiry; skilful compilation and truthful publication of facts in every district; unsparing exposure of abuses; systematic instruction of the people by qualified teachers; enlightened administration of wise laws.
>
> "His ends: the health and longevity of the people, aiding their moral and religious improvement, confirming the obligations of social order, strengthening the foundations of public liberty, and thus promoting the lasting peace and happiness of his country."

H. H.

ART. XII.—*A Treatise on Fever: or Selections from a Course of Lectures on Fever.* Being part of a Course on the Theory and Practice of Medicine delivered by ROBERT D. LYONS, K. C. C., M. B. T. C. D., L. K. Q. C. P. I., L. R. C. S. I., M. R. I. A., Physician to Jervis-Street Hospital; formerly Clinical Assistant to the Meath Hospital; Professor of Practice of Medicine and Pathology in the School of Medicine of the Catholic University of Ireland; Foreign Secretary to the Pathological Society of Dublin; M. R. M. S. Lisbon. Late Pathologist-in-Chief to the British Army in the Crimea, etc. etc. Philadelphia: Blanchard & Lea, 1861. 8vo. pp. 362.

WHAT is fever? what is inflammation? what relations do they sustain to each other? are questions which have been before the profession from the days of Hippocrates to our own, and which have not yet been satisfactorily answered. How many attempts have been made to define the words, how many have tried in vain to tell others exactly what they mean by them! Different views have been given by different observers, each thinking that he was presenting the whole truth, when only one aspect of it had been offered. How characteristic this is of the human mind, when brought into contact with the vast and complicated works and doings of an Almighty Creator, to undertake giving a perfect description and explanation, by setting forth only such facts and appearances as can be embraced within its own narrow field of vision!

In the first chapter of the book before us, these same questions are presented, and the light of the most recent researches and discoveries is thrown upon them. Our author is well qualified, from personal observation, and from acquaintance with the doings and writings of German and French, as well as English pathologists, to discuss the subject which he has chosen for his treatise. He has practised in Ireland, that country of fever, he has practised "in the Crimea at the time of the extensive war in which such great countries," as England, France, and Russia, displayed all their resources. He spent some time at Lisbon, studying an epidemic of yellow fever. He is familiar with the histories of epidemics to be found in the works of writers of all periods of medical history. He shows an acquaintance with the discoveries and views of Louis, Rokitansky, Virchow, Schoenlein, as well as of English, Irish, and Scotch observers, who have studied the disease at home and in the numerous colonies and dependencies of the British empire. He first calls attention to his own country, Ireland, as "the chief *habitat* of typhus fever." He quotes from the returns of the census commissioners, that 222,027 persons had died of fever in Ireland within the ten years from 1841 to 1851. He mentions M. Scrive's calculation that the number of admissions for disease, in the French army hospitals of the Crimean war, amounted to 150,000, fevers and dysentery being the two principal diseases. And do we not find here a cogent reason for studying these maladies in the present situation of our own country?

In proceeding to inquire what fever is, Dr. Lyons adopts the definition of Cullen, as slightly modified by Dr. Christison, consisting in a brief enumeration of the chief phenomena attending the outset of a fever case.

> "After a preliminary stage of languor, weakness, and defective appetite; acceleration of the pulse, increased heat, great debility of the limbs, and disturbance of most of the functions, without primary local disease."

One objection to be taken to this definition, or one deficiency in it, is that the cause is not noticed. Since the days of Cullen, our knowledge of the etiology of fever is decidedly advanced. We now recognize it as the effect of a poison, and this truth should be made prominent for its bearing on our treatment. A poison has been admitted to the blood, has acted on the nervous system, and various phenomena are the consequence. To be sure, there is not one poison, nor is there one fever. By typhus fever we mean the effect of an animal poison, by yellow fever that of a vegetable or telluric poison.

It has always seemed to us, that Dr. Robert Williams did good service by publishing a work on poisons; typhus fever, plague, dysentery, smallpox, and other diseases, being thus presented. If a definition be a summary of phenomena suggestive of important points for the knowledge and treatment of a disease, its cause should not be excluded.

Remarking on the definition thus adopted, Dr. Lyons very properly tells the student—

> "You have here a very good outline of the more ordinary characteristics of fever in its first invasion of the system, but you have withal learned but little that is of an absolutely positive nature; for, as we shall subsequently more fully see, there is but one of the phenomena here indicated which can be regarded as essential and constant."

He then goes on to say—

> "If you ask me to name for you a character of fever which will stand the test of being invariable, constant, and so far *essential* to the pyrexial state, the most advanced researches of the most modern school of pathological inquirers can add nothing to the doctrine propounded by Galen, so long since as the second century of our era. This great observer asserted that the essence of fever consisted in a *calor præter naturam*, or an increase of the animal temperature of the system to a degree greater than that of the physiological standard. The metaphorical significance of the terms applied to the disease from a very early period in the Greek, Latin, and other languages, implies the almost universal recognition of the condition of increased temperature in fever. Now the researches of modern chemistry seem to show that these names are in reality less metaphorical than they would at first sight appear to be. While, furthermore, it is proved that the animal temperature, whether in the physiological state of

health, or in the pathological state of disease, is maintained by a true process of combustion, in no essential respect differing from that which takes place in any ordinary fire, or other agency consuming oxygen and generating artificial heat."

The thermometrical researches of modern observers are referred to, and cited to *prove* an increase of temperature, even when the patient complains of feeling cold. We must admit, then, that, in the present state of medical science, an increase of temperature is essential to that state of the body known as the febrile. But, the word fever, besides its appropriation to designate a state of the body, is also used as a name of diseases. We have yellow fever, we have typhoid fever, and though a febrile state is characteristic of these diseases, it is not essential to them. At certain stages or periods of these diseases, it is generally absent, and we must sometimes admit a patient to have had typhoid fever, though we have never recognized the febrile state, the increased temperature at any period of the disease. So, too, in inflammation, a febrile state is generally but not always found. The words lung fever, brain fever, show the connection in our minds between fever and inflammation. Broussais and others were unwilling to recognize fever apart from inflammation. Now, however, all admit that typhoid fever and yellow fever, frequently attended by inflammation, as they may be, consist in something very different. But what is the precise meaning of these two words? We were told at one time that heat, redness, pain, and swelling were the phenomena of inflammation. Mr. Bennett would give these up, and drop the word inflammation, and speak only of exudation. The profession is not ready to go with him. We must admit that we cannot tell exactly what we mean by inflammation. It may take place without fever, which is almost never an inseparable accompaniment at all stages of the processes. And, however frequently exudation may be found in the lungs, intestines, in the serous membranes of the bodies of those who have died with typhoid or bilious fever, we do not find appreciable alterations of the organs of all who fall victims to these diseases, although fever may have been a prominent symptom. We must use the words fever and inflammation. We cannot say exactly what we mean by them, and yet, too, we are learning more about them. Increased tissue change has some relation to these processes. We recognize that the source of the normal temperature is to be found in the chemical development of heat attendant on nutrient changes perpetually going on in the tissues. In lung fever, in typhoid fever, more heat is made at the expense of the body itself. Food is not taken, the stomach cannot digest it; at the same time, there is call for fuel. Eisenman tells us of pyretogen, of *fever stuff;* the blood is loaded with carbon and hydrogen derived from a disintegration of tissues, the lungs and the heart are working more actively to introduce and circulate the oxygen, and bring it in contact with the worn-out particles, and, thus, caloric is evolved. But what is the cause of this increased activity of heat-making organs? The student sometimes gets rid of old papers from his study, whose presence is an inconvenience, by burning them up. Are these materials of the body which are being gotten rid off in a similar way? A person is shut up in a room filled with exhalations from the bodies of several other persons, or he is exposed to emanations from a marsh, and presently we find the temperature of his body increased. A poison has gotten into his blood, processes analogous to those of fermentation are set up, we have a febrile movement. Sometimes one organ suffers particularly. A person is exposed to cold when the skin is active. There has been increased tissue change, and the skin is getting rid of worn-out particles, and by cold these processes are arrested. The blood overcharged with effete material is driven to the lungs, and we may have diseases known as lung fever, as catarrhal fever; or, a serous membrane may be the seat of the determination; we may have a pleurisy, a pericarditis. Here we have inflammation. A peculiar poison gets into the blood; after a while, a febrile movement is very apparent. There is a decided increase of temperature. The blood is determined to the skin; we recognize heat, redness, pain, swelling, congestion, exudation. An eruptive fever is declared, and the febrile movement subsides, the usual temperature of the body is restored, the circulation ceases to be more active. But, does suppuration take place, are there pustules of the skin and mucous membrane, we have what is called the secondary fever of variola, effete matter is in the blood again, and is being burnt up, or otherwise gotten rid of by excretion. In rheumatism, also, we have fever and we have inflammation as effects of a poison; and, at the same time, neither fever nor inflammation is essential to rheumatism. Now, a recognition of a poison as the cause of variola and of rheumatism is important for the pathology and therapeutics of those diseases; and, whilst we commend Dr. Lyons for dwelling on increased tissue change, and elevated temperature, and quickened circulation, in their relation to fevers, we do not think that he dwells enough on the etiology of the diseases he is describing, absolutely or comparatively. He thus concludes his discussion of the nature of inflammation and fever:—

> "Fever is of general or systemic origin; inflammation is essentially of local origin. Fever and inflammation are both characterized by increase of the animal temperature, increased metamorphosis of tissue, and increased circulation.
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> "In fever these conditions are produced generally and simultaneously throughout the system; in inflammation they are essentially local in their origin, and, if the inflammatory processes remain purely such, they may never even extend beyond the limits of the inflamed structures. In fever (purely such), the nutrient metamorphosis, though commonly attended with interstitial absorption, progresses in both tissues and organs without injury to their structure, and, it may be, without interference with their functions. In inflammation, on the other hand, local change is induced, often to the extent of complete disorganization and destruction of tissue, with the result of organs being spoiled."

This statement of the relations of fever to inflammation does not satisfy us. Let us distinguish between the different meanings of the word fever; let us take the word as applied to a disease. Typhoid pneumonia, rheumatic pericarditis—do not inflammation and fever meet in these terms? How very rare are idiopathic pericarditis, gastritis, and peritonitis! These diseases are almost unknown, except as produced by poisons which give rise to fevers. A rheumatic fever, a typhoid fever, a surgical fever, are attended by inflammation, when the poison in the blood is determined to the pericardium, to the lungs, to the intestines, to the peritoneum, and the tissue is unable to remove it. Sometimes, a hemorrhage, a diarrhœa, a profuse sweat, are the last phenomena of a fever; the tissues seem to have been able to remove the poison from the economy. A patient often gets well of fever without inflammation. Sometimes, congestion of the viscera is the only post-mortem phenomenon. In fatal cases of typhoid fever, softening, ulceration, exudation of intestinal glands are so frequently found that the disease was once called dothinenteritis. Both fevers and inflammations, then, are due to poisons affecting the blood and the nervous system, but these poisons do not always so interrupt the nutrition of organs and tissues as to give rise to the phenomena known as those of inflammation.

But we have said enough of this difficult subject, of what may well be called a "vexed question," and we leave off with the same confession of imperfect acquaintance, of deficient knowledge with which we began.

Let us now say a word of the classification of fevers proposed by our author. He makes three great types—primary, irritative, and eruptive fevers. Under the latter, he places variola, rubeola, scarlatina, miliaria. We might ask why erysipelas, erythema, and urticaria are excluded from this association. These last diseases are attended with fever, are due to a poison, are general diseases, the skin being the part to which the poison seems especially determined. Other skin diseases, as lichen, may be deemed suitable for the same list; and, thus, at every step in nosology, we find evidences that we do not yet know the nature of diseases, and are not able to perfect a natural classification.

Our author places as irritative fevers, gastric fever, gastro-intestinal, remittent, and hectic fever. But why should not this last be associated with surgical and puerperal fever? Has not pyæmia something to do with all of them? In "typhoid fever," have we not reason to believe that secondary fever is sometimes set up from effete matter of the intestinal abscesses getting into the blood? May we not profitably study typhoid fever at a certain stage in connection with variola, surgical fever, and puerperal fever?

Dr. Lyons divides primary fevers into three groups. In the first we have continued fevers, synocha, synochus, typhus, and typhoid. Must we not admit all these diseases to be from poisons? Do we not know typhus fever to arise from exhalations from living bodies? The names *jail* fever, *camp* fever, *ship* fever, show our belief of the origin of the disease in exposure to emanations from the skin and lungs of living men crowded together. Typhoid fever is not due to this poison; it arises in country villages, in isolated houses; it prevails amongst the rich as well as amongst the poor. We recognize these two diseases as distinct, not merely from symptoms and history, but also in their etiology. To be sure, we do not know what is the cause of typhoid fever. Is it a poison manufactured in drains and water-closets? Is it taken into the system by drinking water from wells into which sewerage has penetrated? Is it an *animal* poison, or can vegetable decomposition give rise to it? What have telluric emanations to do with it? Again, in the diseases known as typhus and typhoid fever, is there only one poison? What do we mean by the typhus state of various diseases? Is it not connected with the presence of effete matter of the body, being in the blood, and thus brought into contact with the nervous system? A poison first may interfere with the functions of the nervous centres presiding over circulation, secretion, excretion, as well as with other organs, but in time new poisons are generated, or, rather, retained in the system, secretion and excretion being suspended. May we not thus account for similar symptoms and conditions in various fevers, as typhus, typhoid, surgical fever, erysipelas, puerperal fever, diphtheria? But what is the cause of synocha and synochus? Fatigue will give rise to fever. If the nervous system be exhausted by muscular exercise, by intellectual effort, by moral emotion, we may have a fever not caused by poisons from without, but by poisons resulting from imperfect excretion. Besides, too, we probably have a good many telluric, vegetable, and animal poisons which singly, or in combination, give rise to various fevers. We cannot handle these poisons, we cannot analyze them; and Dr. Lyons seems to us wise in retaining the old terms synocha and synochus, and in trying to find out what was meant by them, in trying to give us more definite ideas about them. He tells us also about febricula and relapsing fever, but he does not say anything about the plague, the relations of which to typhus fever should be brought forward in every scientific treatise on fevers. What connection has this formidable epidemic with intermittent and remittent fevers? Does it proceed from an animal, a vegetable, a telluric poison, or from a combination of the three? Here we have one of the defects of the classification adopted by Dr. Lyons, etiology not being allowed its due influence. Thus, yellow fever is classed amongst remittent fevers, and is not distinguished from bilious fever; and the general characters of the three great groups of the primary, the irritative, and the eruptive fevers, given in the chapter on the classification of fevers, are not to us satisfactory. Thus, our author tells us—

> "That primary fevers are essentially characterized by the development of a general pyrexial state, independent of specific pathological lesion, and having no necessary connection with localized disease in any portion of the body, or in any organ or tissue. All organs, and perhaps all tissues, participate in the febrile action, when once it is established; but it cannot be said to originate in any one part more than in another, saving so far that the considerations already adduced show that the first link in the chain of morbid actions may be found to implicate the nervous system.
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> "The irritative fevers, on the other hand, owe their existence to lesion of a well-defined kind in particular parts of the system. They have a true anatomical seat, or origin, and are to be regarded as the constitutional expression of localized disease.
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> "While, therefore, the primary fevers are independent of all localized diseased processes, and are commonly to be met with unattended by pathological changes of any kind, the irritative fevers recognize no existence independent of local disease of some kind.
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> "The eruptive fevers are characterized by the absence of all specific lesions of the more important viscera, while the cutaneous surface is so frequently the seat of pathological processes in these fevers that, in the majority of instances, our diagnosis between the individual fevers of this group depends on the special character of the rash or eruption presented on the skin."

Now we must maintain that typhus and typhoid fever are characterized by lesions, in the same way, though not to the same degree, as are scarlet fever, measles, and smallpox. All of these diseases are general, constitutional. No one of them consists in the lesion of any one organ or tissue. Two hundred and eighty-seven pages of the first volume of M. Louis' work on typhoid fever are devoted to pathological anatomy. Whilst there is scarcely an organ or tissue of the body which may not be affected by the disease, the intestinal glands are almost always the seat of changes. In typhus fever the lungs are very often the seat of important lesions. In scarlet fever the skin, the throat, the kidneys, are especially the seat of changes. In measles the mucous membranes of the lungs and eyes are suffering parts. And in hectic fever, or surgical fever, or rheumatic fever, a poison, generated in the system itself, disturbs the innervation and circulation, gives rise to general symptoms, and, secondarily, to lesions of particular parts or organs. All these diseases are due to poisons; all these poisons acting on the blood and nervous matter provoke efforts of nature to expel them from the system, and the great emunctories of the economy, the skin, the liver, the lungs, the intestinal glandular system, suffer from an especial determination of the poison to one or more of them. We know of arsenic, of corrosive sublimate, of strychnia, of opium, that each is determined to certain parts or organs. The salivary glands free the economy of one poison, the kidneys of another. And we recognize the same truth in this case of the impalpable animal, vegetable, and telluric poisons. Opium and the typhus poison both act on the cerebral hemispheres; strychnia and the poison of hydrophobia are determined to the spinal marrow; but the words encephalitis and myelitis are not applicable in any of such cases. There is a suppurating wound; there are minute abscesses in pustules of smallpox; fever sets in, but it is not to be regarded simply as "the constitutional exponent of specific disease." This secondary fever is from a poison acting first on the blood and on the nervous system.

But we have perhaps said enough to show why we object to the classification of our author, and to set forth our own ideas of the propriety of arranging fevers as all arising from poisons, of most of which, to be sure, we know nothing beyond their effects on the human body.

In the fourth chapter of the book under review we find a good account of simple continued fevers. We like what our author says of bloodletting in synocha. He has been speaking of fever implying increased action in all parts of the system, and the production of a great quantity of effete material resulting from the increased metamorphosis of the tissues. He then goes on to say:—

> "Under these circumstances, the course of the blood surcharged with the effete materials produced by the consumption of the tissues in fevers, may be compared to a stream, which, impregnated with earthy particles, silt, and other impurities, deposits them in various points of its course, and then flows on pure and limpid. Such analogies as these, however, must not be pushed too far; the lungs eliminating carbon and hydrogen; the skin throwing off water, salts, ammonia, and other compounds; the kidneys carrying off urea, uric acid, chlorides, sulphur, phosphates and their allied bases, and the intestinal canal acting as the common-sewer of the system, play the part of so many strainers or purifiers. We must not forget, however, that in a highly complicated machine like the animal body, each part reacts upon all the others, and the blood itself, when rendered impure, will in its turn influence the nervous centres, which stimulate the vascular system and the other parts engaged in the febrile processes. It is under this view that venesection may be defended when employed with the object of lessening the amount of stimulant fluid, 'impure fluid,' which is reacting on the nervous centres, and thus adding fuel to the fire, and keeping up the cycle of pyrexial actions. We do not deny, then, that there are cases in which a bold and early venesection may have the effect of partially arresting the process of febrile actions, or of preventing them from spreading to a wider circle of parts. Mark, however, that in this aspect, bleeding answers but one purpose; it may control, but it cannot cure the fever. Febrile action, if continued only for one hour, produces effete material, as the burning of coal or wood produces ashes. The pathological or febrile ashes must be eliminated from the system; bleeding cannot in any conceivable way effect this object; it can only be accomplished by elimination through the pulmonary surface, the skin, the intestines, or the kidneys, acting singly or in combination."

Considerations like these may well be impressed on the mind of the student. We study the natural terminations of fever, lysis and crisis, to get indications of treatment. We find nature acting to get rid of poisons, sometimes gently and imperceptibly, and sometimes convalescence dates from some violent effort. Can we by emetics, cathartics, sudorifics, or bleeding, get rid of the poison when its first effects are noticed? Can we break up a fever? Dr. Jackson, of Boston, in his last letter to a young physician, has avowed his belief that an emetic will sometimes act to interrupt pyrexial action, and that its administration will sometimes be followed by prompt convalescence. He also calls attention to the fact that but seldom has the physician an opportunity of using this means. Fever begins so insidiously, its early symptoms are so uncertain, that we are seldom called to take charge of a case till the poison is thoroughly incorporated in the system. Dr. Lyons tells us—

> "There can be no doubt that a strong emetic of the potassio-tartrate of antimony, sulphate of zinc, ipecacuanha, or mustard, may give a powerful revulsion to the nervous system through the gastric filaments of the vagi, and it may be that in the minor febrile states it will be found possible to arrest the pyrexial action by such means."

> "It will be in the recollection of almost every practical physician, that he has seen cases in which obstinate gastric irritation, and incapacity of retaining food or medicine have been directly traceable to the abuse of the emetic treatment of fevers."

So, too, in the use of purgatives. Some practitioners look to purgation as only next in importance to bleeding.

> "The Hamiltonian method once took the place of the hydropathic system of the present day; the one insisted as strongly upon the all sufficiency of intestinal elimination as the other upon that through the skin. Cases will undoubtedly occur in which purgation is the most obvious as well as necessary therapeutic indication to be followed in the first instance; but no practitioner of any experience can have failed to meet with cases in which excessive purgation has been productive of the most injurious effects."

With regard to sudorifics and sweating as a means to free the system from poison, the language of Sydenham is quoted that only those sweats which are the result of coction or digestion of the materia morbifica are available for crisis.

> "All practical physicians must be aware of the fact that sweating is not infrequently a symptom of most unfavourable augury in all kinds of fevers." "Sweating cannot be regarded as a curative process *per se*, and is to be regarded as a safe and reliable therapeutic and curative process only when it forms part of a general eliminative action in the system."

We have thus cited passages from our author to show how he looks upon the eliminative treatment of fever. He would appeal gently to the various emunctories, as, in each case there may be a special indication of the propriety of quickening the activity of one of these organs. But some of the fever poisons seem so directly determined to nervous centres of organic or animal life, that at all times one of the nicest questions in the treatment of fevers has been as to the use of stimulus. Leeches to the temples, cold lotions and showerings, are, to be sure, especially indicated in synocha. Our author agrees with Dr. Jackson in deprecating bleeding from the temporal artery. The ice cup applied on the shaven crown is called a most excellent remedy for severe cases. A proper discrimination is made between the cerebral symptoms of synocha and those of typhus. In these latter cases the poison weighs upon the nervous centres of secretion and excretion, the blood is thronged with effete matter which is to be gotten rid of only by stimulating the circulation and the emunctories. Though meningitis and encephalitis are simulated and threatened in synocha, the congestion of typhus is a very different matter, and must be very differently treated. The fact of typhus frequently proving fatal by cerebral complications in the better class of society, as constantly as by thoracic secondary lesions amongst the lower classes, is properly dwelt upon. That state of cerebral and nervous excitement resembling the condition of delirium tremens, is also noticed, as well as the delirium ferox, the high excitement, with violent muscular efforts, sometimes suddenly succeeded by profound prostration and collapse, or by coma, stertorous breathing, and relaxed sphincters. Now these cases are not to be treated as brain fevers. Dr. Lyons says:—

> "Numerous dissections warrant me in stating that I have found sensible congestion of the brain and its membranes with increased serosity in the ventricles and subarachnoid spaces in cases which had presented no cerebral symptoms whatever during life; and again, that where there had been delirium ferox, and even in more than one instance, coma, no appreciable lesion could be detected in the brain or spinal cord after the patient's death. Many of the cerebral

symptoms in typhus are explicable on the supposition that they are caused by a temporary congestion of the introcranial vessels; others, it is equally probable, are due to diminished nutrition of the brain, from its receiving an impure and inadequate supply of blood. A third class of cases, including those with comatose and paralytic symptoms, may be traced to the influence of the highly carbonized and otherwise deteriorated blood which is sent to the brain and spinal cord."

Now, all these considerations are eminently practical. And we are glad to see how much and how well our author discourses on treatment. The word self-limited has been applied to fevers, and with some truth; but certainly there are no diseases which so task the skill of the physician, or in which, by doing or letting alone at the proper moment, so much can be done to contribute to a favourable issue. Regimen and drugs are not more valuable in any diseases than in fevers; nor are powers of observation and reasoning, discretion and common sense, in medical attendants, of more use in any other class of cases. This very question of stimulus, when to give and what to give, is a difficult one. We believe the blood to be loaded with effete hydro-carbonaceous products. Shall we introduce these same elements in alcoholic and vinous drinks? The brain is already congested —shall we give opium? And we cannot reason out these problems. We are not so thoroughly conversant with all the processes of fever as to enable us to tell positively that such a drug in such an application will act favourably in a given case. We cannot yet establish a routine practice. Each author can only describe such varieties in the affection of different organs and tissues as have fallen under his notice, and say what in his hands has worked favourably. Dr. Lyons properly brings forward, as the result of his observation, "that cases in which the action of the system is uniform and well-balanced in all the organs and functions, may be regarded as comparatively safe; those, on the other hand, in which there is an excessive preponderance of one set of actions, must be viewed with suspicion, if not alarm. While all parts of the machine are working with uniform pressure, though at a high velocity, its safety is not immediately endangered." Here we have considerations to decide us in our treatment. We must not interfere to disturb regular and proportionate efforts of nature, but where the nervous system or the constitution is being overwhelmed, we may try to appeal to one or other of the emunctories. We may administer such articles as will rouse the nervous system or the constitution to throw off what otherwise would depress them beyond recovery.

The combination of tartar emetic and opium, brought forward by Dr. Graves, when the brain especially suffers, the exhibition of a mustard emetic when the lungs are especially oppressed, turpentine in typhus bronchitis, grain doses of calomel with opium, all these and other remedies are brought before the student with a judicious discussion of the circumstances under which they may be used. He is told that the physician at the bedside of a typhus patient "is in the position of a captain of a ship, who skilfully makes his vessel ride out the storm, not by any one specific mode of action, but by a combination of skill, intrepidity, and readiness, which enables him to see at once every possible source of danger, and to use every means at his command to obviate it.".

We are glad to see a number of illustrative cases, of brief histories and post-mortem appearances. The author's observations have been in various localities, amidst various circumstances of climate, regimen, and race. He calls attention to *Comparative* Pathology. He remarks on the dissimilar types of febrile disease developed amongst the armies engaged in the Crimean war. Synocha, with high pyrexial action requiring bleeding, was prevalent amongst the Sardinians, whilst in the English, French, and Russian camps "putrid types of fever prevailed, in which stimulants were urgently called for." A sweating fever, with foul emanations from the skin, prevailed amongst the Turks, we are told, also.

> "I have myself formed the notion, but I in no way insist on it as a well grounded hypothesis, that the sthenic or synochal types of fever are in the present day, and, perhaps, have always been, most remarkably developed amongst the graminivorous and herbivorous races of men, while the putrid or typhus types of febrile action more readily develop themselves in the races amongst which animal food constitutes a large part of their ordinary aliment."

We have a good deal yet to learn about typhoid fever, its epidemic and climacteric variations, as well as those suggested in the paragraph which has just been cited. We welcome, therefore, what Dr. Lyons has to tell us of this disease in the Crimea. M. Felix Jacquot prepared a valuable treatise on the typhus of the eastern army, which was published after the author's death.

The Committee on Epidemics of the American Medical Association is collecting valuable materials for a scientific account of the fevers in this country. The first question is, what is typhoid poison, what is its origin? and, then, how do atmospherical climacteric peculiarities, how do peculiarities of occupation, regimen, and constitution modify the activity of the poison? Why in certain cases is it determined to the lungs, why in others to the brain? Why does yellow fever so generally affect the liver and the gastric mucous membrane? We find some information on all these points in the book before us.

But we have lingered quite long enough over its first chapters. Yellow fever is the subject of the ninth chapter, and of the two following. The disease was observed at Lisbon during the latter half of the year 1857, when an epidemic prevailed in that city.[1] These chapters are chiefly valuable for the history of that epidemic on which they are based. Dr. Lyons does not allude to Dr. La Roche's work, which should be regarded as the standard treatise on the disease, containing so full a summary of whatever had been observed or written on this subject to the date of its publication, with a great deal of original valuable matter. We do not find any reference to Dr. Clark's edition of Dr. Bartlett's work on fevers, and we are very much surprised that such thorough, well digested, and valuable treatises should not be recognized by the Professor of the Practice of Medicine and Pathology of the Roman Catholic University of Ireland.

We have already objected to yellow fever being classed amongst remittent fevers. The symptoms of the disease vary very much, making it even difficult of recognition, and requiring the adoption of forms or groups in a description. Dr. La Roche prefers the division adopted by Dr. Wilson, who speaks of an inflammatory and congestive form, each subdivided into three grades. The inflammatory and congestive varieties, the typhoid, the malignant, the cold form were proposed by Dr. Jackson, and adopted by Dr. Copeland. Dr. Lyons remarks very properly—

> "I can have no doubt that a great deal of the discrepancy of statement and conflict of opinion in the accounts we possess of the several epidemics of yellow fever occurring in various localities, has arisen from the different forms which the disease presents, being confounded in one common description, embracing the phenomena of all."

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[1] See No. of this Journal for April, 1861, p. 480.

The five forms under which the disease is described by our author are, the algid, the sthenic, the hemorrhagic, the purpuric, the typhus. It is a little curious that the first form of a "fever," of which disease increased temperature is considered by many as the one characteristic feature, should be the *algid* characterized by a diminution, sometimes of as much as two degrees, in the animal temperature. This phenomenon is, to be sure, in accordance with what is offered in the cold stage of intermittent and remittent fevers: and in the algid forms of those diseases, and in poisoning by arsenic and corrosive sublimate, a febrile movement is sometimes amongst the symptoms; and, sometimes, the skin is cold and clammy, the extremities are cold, the calorifacient processes being oppressed by the poison.

This algid form, during the Lisbon epidemic, occurred most frequently in persons of the very lowest classes, but was not limited to either sex or to any age; old and young alike being amongst its victims. The prostration of strength was early and extreme, and the hemorrhagic tendency present to the most marked degree in a very large proportion of cases. This we should expect from the connection observed between diminished temperature and loss of blood.

Dr. Lyons gives an interesting table of pulse-rate and temperature, in his remarks on the "sthenic" form, and thus shows that the highest pulse-rate and highest temperature did not correspond, and that there was no constant uniformity of relation between the two sets of phenomena. In sthenic cases there is a remarkable elevation of the temperature from the outset, an increase of three, four, or five degrees being common, and that of nearly seven having been observed. How great the difference between these two forms, the sthenic and the algid, as revealed in these accounts of the temperature of the bodies of patients classed under the two heads!

The cases under the hemorrhagic form are those which, next to what were classed under the algid, present the most "characteristic, appalling, and impressive features of the disease." Our author dwells on "the special and highly characteristic physiognomy" of yellow fever, the salient features of which are readily recognizable and taken in by the practised eye at a glance; and he goes on to say:—

> "I must avow, after a very extensive experience of the worst forms of epidemic disease at home and in foreign countries, and at the seat of war, that I have seen few assemblages of symptoms of a more striking, and, indeed, horrifying, character than those often presented in yellow fever cases, nor any in which more impressive feelings are called forth in the reflecting mind."

In a single case, there was hemorrhage from the eyelids, nose, gums, tongue, stomach, intestines, and blistered surfaces.

> "The constantly fatal character of this form of the fever is pointed out, as well as the fact that death seems to take place in many instances directly as the result of the hemorrhages, and generally within from twenty-four to thirty-six hours after they have set in."

Under the purpuric form, cases are designated in which the pyrexial state was well marked in connection with spots and patches of purpura. These were frequent in algid cases. One case is referred to in which the temperature was above the normal standard when the pulse had fallen to fifty-two, and the patches were precisely similar to those so often seen in the epidemic purpura hæmorrhagica of Ireland.

In only a few cases were typhus phenomena observed. These were presented "in two orders of combination." In one they appeared as the primary and essential characteristics from an early period of the febrile invasion, such cases resembling those of typhoid pneumonia, with jaundice. In other cases the patient passed through the sthenic or hemorrhagic forms, which were supplanted by the typhus. There was an increase of temperature in these cases to an extent of four or five degrees; they proved fatal, and no follicular lesion was detected in any of them after careful examination.

In reference to Dr. Clark's views of the connection of cerebral symptoms and black vomit with congestion and imperfect action of the kidneys, we have looked with interest at what our author has to say on the renal function.

> "Almost complete suppression was observed in certain cases. In other instances, and this not unfrequently, the urine has been abundant, normal in specific gravity and reaction, at times high-coloured, of a rich straw or amber colour, at times highly loaded with lithates, and presenting the brick-dust sediment with more or less colouring matter in different cases. Under other conditions, the urine is found coagulable by heat and nitric acid, and it is occasionally brownish-red, smoke-coloured, or variously tinged, from more or less admixture of blood elements. No deficiency of any of the normal constituents of the urine was observed by me in any single instance, where there was not a total or partial suppression of this secretion, which seems to stand in very intelligible relation with the generally depressed condition of the vital powers and the stagnation of the circulation more especially, and was only one of several similar states of suspended action in the system. In a few instances, albumen was found in the urine in connection with this depressed condition of the circulation.
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> "On referring to the results of the post-mortem examinations in yellow fever cases, it will be found that congestion of the kidneys, in common with most other internal organs, was sufficiently often observed."

A little further on, our author speaks of urine with high specific gravity and with more or less abundant deposits of variously coloured lithates, as constantly attending the well-marked pyrexia of the sthenic cases, and of the same peculiarities being found in cases classed as hemorrhagic. The excretion of colouring matter having the usual biliary reaction was often observed in connection with pyrexial and apyrexial states. Parotitis, an efflorescent rash, bloody furuncles, are among the symptoms of yellow fever at which we look when we ask to what parts or glands is the poison especially determined.

> "The state of the liver was the most remarkable, the most constant, and, to my mind, the most inexplicable condition presented in the post-mortem examination of fatal yellow fever cases. I believe that it may be affirmed that some departure from the normal state of the organ was an absolutely constant condition in all cases which proved fatal. It was not only so with regard to the cases examined by myself, but the concurrent testimony of all my learned *confrères* in Lisbon pointed to the same result. The colour most frequently presented was that of a rich fawn yellow, or buff, various shades being observable in different cases."

M. Louis tells us also of the epidemic at Gibraltar—

> "That the most remarkable lesion of the liver was the alteration of its colour, which was more or less exactly the same in all the cases, and through the whole extent of the organ. This alteration consisted in a discoloration, the liver being sometimes of the colour of fresh butter, sometimes of a straw colour, sometimes of the colour of coffee and milk, sometimes of a yellowish gum colour, or a mustard colour, or finally, sometimes an orange inpistachie colour." "In the present state of science it seems to me impossible to determine the nature of this alteration."

Dr. Lyons made microscopic examinations of the hepatic tissue, and the hepatic cells were found filled with globular oily and fatty matter. The natural appearance of the cell was completely altered, its outlines obscured and its nucleus rendered invisible. Dr. Alonzo Clark, of New York, in 1852 found on microscopical examination of a yellow fever liver "a fatty state of all the secreting tube-cells, and such an abundance of free oil-globules of large and small size, as to cover and obscure every thin section which was made of the liver," and asked the question, "is not the change so constantly observed in the livers of those dying of fatty fever an acute fatty degeneration? Dr. Lyons has also inquired into the specific gravity of the liver, and gives a table of twenty-four cases from which there is shown a general correspondence between fatty degeneration and low specific gravity, and that the specific gravity is a more accurate measure of the fatty change than that furnished by the colour of the hepatic substance. In ten cases an attempt was made to determine the absolute quantity of fatty matter by maceration of known quantities in sulphuric ether. Proof was thus obtained that with the yellow, or buff-coloured, or even the chocolate-coloured state of the hepatic substance, there was found a considerable, and in some instances a very marked increase of the fatty elements.

In the eleventh and last chapter, marked as supplementary, there is given a summary of the chief climatological and other elements determined in connection with the Lisbon epidemic of 1857, extracted from an official report to the President of the General Board of Health at Lisbon. After careful inquiry in all directions no evidence was found to warrant the conclusion that the "*importation* theory was even moderately well founded," though a belief in it was widespread and general, and not confined to any class of the community.

> "All parts of the city largely attacked by the epidemic presented in common certain conditions of insalubrity, which may be classed as follows: A. Defective water supply. B. Total absence of, or extremely deficient sewerage. C. Total absence or incompleteness of house-drains, privies, and a consequently unclean state of the streets. D. Badly-constructed dwellings, with deficiency of light and air, and want of thorough ventilation. E. Absence or defective condition of tertiary and secondary sewers."

Thus we have additional proof of the great importance of effective sewerage and of an abundant supply of water to the health of cities. There was no proof of contagion and no general belief in it. From 20 to 40,000 of the inhabitants ran away from the foci of infection, but

> "Devoted attention to the sick was the universal rule with all classes of society; and even on the friendless and the stranger I have seen all the care and anxious solicitude bestowed that could be lavished on the nearest and the dearest friend or relation."
>
> "An excellent tranquillizing effect was produced on the public mind by the truthful and highly creditable manner in which the daily bulletins, giving a statement of the progress of the epidemic, were published by the authorities."

The meteorological conditions at the outbreak and during the prevalence of the epidemic are discussed at some length, and we are told that—

> "So far as the available data can be relied on, there is no evidence of any very unusual atmospheric disturbances having preceded the outbreak of the epidemic; nor again, during the months in which the epidemic reigned, is there to be recognized any very extraordinary departure from the meteorological conditions of the same months in former years."
>
> "The dew-point for November and December was remarkably high, 54.5 and 50 as compared with 49.2 and 46.15, the highest respectively in any of the preceding years. There is, however, no absolute relation between high dew-point and the epidemic outbreak in the preceding months."

We have thus endeavoured to give our readers an idea of the contents of the volume under review, and they will probably agree with us that it constitutes a valuable addition to our medical literature—that it is a book which is wanted, notwithstanding that so many treatises and histories of the subjects of the work have already been published. It is not an elaborate scientific treatise, gotten up and written with the skill and carefulness characteristic of the books prepared by Dr. Bartlett and Dr. La Roche. It is, however, a very interesting and a very readable book. It conveys a great deal of valuable information, and supplies a want which has been felt of a succinct and satisfactory statement of the application of the views and discoveries of recent writers on physiology and pathology to the various fevers, in the treatment of which, as well as in prophylaxis, the practising physician feels so much the want of more light and of greater certainty.

G. C. S.

ART. XIII.—*A Manual of Human Microscopic Anatomy.* By A. KÖLLIKER, Prof. of Anat. and Physiol. in the Univ. of Würzburg. With 249 illustrations. London, J. W. Parker & Son, 1860.

THE name of Professor Kölliker has long been identified with microscopical anatomy, and most of our readers are familiar with the English translation of the first German edition, issued in 1853–4, under the auspices of the *old* Sydenham Society, and republished in this country in 1854. Since that period two German editions have appeared; one in 1855, and one in 1859. The present English version, we are told, "is, in the main, a condensed version of the second German edition (of 1855). But every material addition that has been made to human microscopical anatomy, up to the present date, will be found incorporated in it. The book is, therefore, brought well up to the third German edition—that of 1859."

The mere issue of a new edition of a work so well known would require no more than a bare notice at our hands, were it not that it contains a frank acknowledgment of the accuracy of certain new histological facts of the highest doctrinal importance at the present time.

Those who have been interested in the gradual development of the cell-doctrine, and who have watched the complete revolution it has recently undergone in the hands of such men as Remak, Reichert, and above all of Virchow, will remember well that the general idea underlying the histogenetic doctrines of the earlier editions of Kölliker's Manual, was an acknowledgment of Schwann's theory of free-cell-formation. In fact, though an independent observer of the highest order, a careful perusal of these earlier editions shows that Kölliker was in many respects a disciple of Schwann, in his doctrinal ideas. Like Schwann, he saw in the fluid or semi-solid intercellular material the cyto-blastema out of whose plastic substance the cells had been produced; and while stubborn facts compelled him to admit that "botany knows no free cell development," and that "free cell development is in man and the higher animals far less common than has been hitherto assumed," he yet believed Schwann's theory to be applicable to "the development of the chyle and lymph corpuscles, of the cells of certain glandular secretions (spermatic cells, ova), and gland-like organs (closed follicles of the intestine, lymph glands, splenic corpuscles and pulp, thymus); lastly, of the cellular elements of the pregnant uterus, in the corpus luteum, in the medulla of fœtal bones, and in the soft ossifying blastemata." When in addition to this long list it is remembered that Kölliker believed that "in fact *all pathological cell-formation* properly comes under this head," it will be understood that Schwann's doctrine played a large part in his notion of the process by which tissues are produced.

So well has this been appreciated that many of those who, without personally investigating the subject, have opposed the teachings of Virchow and his school, have relied on Kölliker as a strong authority against the new views, and more than one recent publication has rejected the progressive ideas, and clung to the old doctrines, reposing on Kölliker's work for their justification.

But while a motley host of quill-drivers were beating back the wave of progress as best they might, the little band of practical microscopists who submitted Virchow's new law "omnis cellula ex cellula" to the test of actual observation, were one by one won over to his side. Among these converts we now find Kölliker.

The present English edition of his "Manual" is issued under his own supervision at his own instance, for reasons set forth in its preface by himself. The modifications in views are therefore *his own*, and not the botch work of any meddling editor. And of these modifications we have first to notice an utter renunciation of that theory of free-cell development which has made the name of Schwann so famous.

Let our author speak for himself.

"§ 9. FORMATION OF CELLS.—With regard to the formation of cells, a distinction has hitherto been made between the *free origin* of them, and their production *through the intervention of other cells*. The farther, however, investigation is prosecuted, the occurrence of a free cell-formation becomes more and more doubtful; and it appears that all animal cells only arise, as in plants, in dependence upon other pre-existing cells. In this process of cell-multiplication, it is pre-existing cells which either produce secondary cells, as they are called, or multiply by division—*endogenous cell-formation, and cell-formation by division*. The cell-nuclei always play a very essential part in the multiplication of cells, and appear as the proper centres of formation for their evolution.

"Whilst *Schwann*, in animals, in contradistinction to plants, regarded the free cell-formation as being the more frequent—that by the intervention of other cells, more as the exception—observers are now coming more and more to the conclusion that even in this respect animals and plants agree. As for me, I have already long since shown (*Entw. d. Cephal.*, 1844; *Ann. d. sc. Nat.*, 1846) that in embryos all the tissues are built up of the descendants of the cells which have arisen after the cleaving of the yelk; and that even in the adult, in the most widely-distributed tissues consisting of cells, as in cartilages and in horn, free nuclei nowhere occur. Accordingly, I found myself constrained, in the first edition of my German *Handbook of Histology*, to limit the free cell-formation very much. Quite recently, *Virchow* (in *Beit. zur Spec. Path. u. Therapie*, 1854, p. 329) has made known a series of facts, from the department of pathological anatomy, which show that in many places where formerly a free cell-formation was admitted, it does not occur. If to these facts are added the new observations of *Virchow*, with regard to the development of bones, as well as the recent investigations into the formation of the lymph-corpuscles, *we may indeed conclude that a free formation of cells does not anywhere exist*." (p. 16.)

It will thus be seen that Kölliker has formally renounced all adhesion to the free-cell-development theory, and has deliberately accepted *Virchow's* law of *continuous development* of cells only out of cells as an indisputable fact. And while theorists of variable character and calibre have been abusing *Virchow* as an innovator, and rejecting *his facts on theoretical* *grounds*, it is somewhat amusing to contrast with their ideas of the great Berlin pathologist, the sober opinion of a man like Kölliker.

> "The treatises of *R. Virchow*, who, of all living pathologists, has made the best observations, in his *Archives* and in the *Würzburg Proceedings*, are of the greatest importance." (p. 6.)

The support of an observer so careful and so independent as Kölliker will give great weight to the new views of cell-development; and we may, perhaps, regard the doctrine of the spontaneous generation of cells as being as completely exploded as the doctrine of the spontaneous generation of animals.

And this one possibility of the evolution of form out of the formless, of the capability of organic fluids to assume bodily shape by their own energies, once denied authoritatively, how many curious pathological and physiological dogmas, not long ago quite dominant, are scattered forever to the winds. How utterly and completely that splendid exudation theory, which for twenty years has been dominant in the scholastic comprehension of morbid processes, falls to the ground, if the transuded fluid can in no manner serve as the *blastema* or form-producing liquid for new elements, if, in a word, the fluids be passive, and the organic forms the active agents in the organic processes. How the old solidistic ideas, so long supposed to be quite trampled out of existence by the refined and systematic humoralism of Rokitansky and his followers, loom up once more with fresh force and vigour in a newer and more scientific dress!

It is not in our power to follow Kölliker through the six hundred pages of this elaborate volume. Much of the matter is identical with the details of the Sydenham edition, for many of these points are facts forever acquired for science; but much also has been modified, the recent literature of the subject has been carefully considered, whole paragraphs have been remodelled or re-written, and the volume may be regarded as not merely an improvement upon former editions, but as wholly superseding them. To comment upon all the new points introduced would be to review the whole ground of histological progress during the past ten years, a task far too large for our present purpose. We shall, therefore, conclude with a few remarks on a subject which is important chiefly from its pathological relations.

Within the last few years "connective tissue" has been made the object of a series of most interesting observations, and has constantly assumed fresh importance until the best modern investigators (Virchow, Weber, &c.) have come to look to its elements for the origin of the great majority of those pathological products (pus, lymph, cancer cells, &c.), which were formerly thought to spring up spontaneously in an organizable blastema. The true anatomy of connective tissue, and especially the process of its development is a subject related in the nearest manner to pathological doctrine. In his conceptions of connective tissue, as laid down in our present volume, Kölliker, while obliged to go a long way towards the abandonment of the older notions, as taught by Schwann, remains adherent to one of Schwann's notions, which careful observation shows so clearly to be incorrect that we must confess surprise at seeing it retained in this volume. He still asserts that the white fibrous element of connective tissue is developed by the elongation and subsequent fibrillization of the primitive embryonic cells, the nucleus of the cell remaining permanently imbedded in the bundle thus produced.

Pathological studies which accord fully in their results with Virchow's doctrine of the histogenesis of connective tissue and the study of several human embryos from one inch long upwards, have so fully convinced us that this idea of the development of the white fibrous tissue so called is incorrect, that we cannot close without making a few remarks upon the subject; for in fact white fibrous tissue wherever this exists represents not transformed cells, but the transformed matrix or intercellular substance, and this is true in the tendons and subcutaneous areolar tissue as well as in the so-called fibro-cartilages, where it has long been acknowledged.

Kölliker, with great propriety, includes, under the "tissues of connective substance" (connective tissue group), not merely connective tissue properly so called, but also mucous tissue, yellow elastic tissue, cartilage, bones, and teeth.

All these tissues possess, in common, certain structural and histogenetic points of the highest interest.

They all originate as a mass of cells (primitive embryonic cells) nearly or quite in contact, between which as the developmental process proceeds a variable amount of fluid, semi-solid or solid intercellular substance, or matrix arises.

The cells multiply in number by division, matrix being subsequently developed between the broods of cells in the same fashion as between the original or parent cells of the tissue.

The cells may remain rounded or oval, increasing to a variable size, and presenting great diversities in contents (cartilage cells, adipose tissue cells), or they may become branched and stellate, the processes of the branched cells usually anastomosing so as to form intricate networks adequate to the transportation of fluids (connective tissue cells, cells of mucous tissue, pigment cells, bone cells, bone lacunæ so-called). Or finally the cells may be transformed into long hollow fibres anastomosing with each other, and losing in their adult condition almost every trace of their cellular origin (yellow elastic fibres, dentinal tubules, and the like).

In the actual condition of the adult tissues, these differences in the form of the cells are not of that sharply-defined kind, that every tissue of the group has its specific cells by which it is distinguished; on the contrary, they pass into each other by the most gradual transitions, which is quite what should have been expected, when it is borne in mind that they all arise by the transformation of cells originally identical.

The matrix or intercellular substance above alluded to as being developed between these cells *pari passu* with their development, is subject to as great a diversity in its transformations as the cells themselves; besides the greatest diversities in quantity, the following chief qualitative transformations may be noted between which every grade of transition exists.

(1.) *The matrix may remain semi-fluid, soft and jelly like*, yielding a filamentous precipitate with acetic acid. This is "mucous tissue" so called, a term which Virchow applies to the vitreous humour of the eye, the umbilical cord of the new-born child, the cutaneous and subcutaneous tissues of the fœtus, and many pathological formations identical in structure with these; and although Kölliker limits this class within much narrower bounds, allowing the term mucous tissue to be applicable only to the vitreous humour, his description of the other tissues above mentioned accords so completely with the facts of the case, and his rejection of the term mucous tissue as applied to them depends so entirely upon his desire to classify tissues as they *become* in the adult state, rather than as they begin in the embryonic condition, that the precise limits of his classification is a matter which modifies in no essential degree the comprehension of the subject to be derived from his writings.

(2.) *The matrix may become solid, still retaining, however, a homogeneous, more or less completely translucent character.* This is especially the case in the *cartilages* (true or homogeneous cartilage, articular, costal cartilages, &c.). The essential character of cartilage, however, is not to be found in this state of the matrix, for cartilages, at the beginning, are a mere mass of cells without any matrix; and this state, which is the normal initial condition of every cartilage, may remain permanent under certain circumstances, as is normally the case, for example, in the cartilage of the external ear of the *mouse* and many other mammals.

(3.) *The matrix may become solid, and fibrillate as it solidifies, more rarely after it has become homogeneously solid. The fibrillated matrix constitutes the so-called white fibrous tissue.* The fibrillization begins in the already existing fluid or jelly-like matrix in the immediate neighbourhood of the cells, and proceeds from these outward into the matrix, *and hence it happens while the process is yet incomplete, if the tissue be torn with needles, fragments of the fibrillated matrix are readily isolated, containing the cells imbedded, and the delicate cell wall being easily overlooked if appropriate treatment is not resorted to, the whole fragment has been regarded first by Schwann and his followers, and even yet by Kölliker, as a metamorphic condition of a cell, whereas in fact it represents a cell, plus a certain exterior and adhering fragment of the imperfectly formed matrix.*

The essential difference between such a mass of connective tissue as is found in a tendon or a ligament, and the areolar tissue so called, is to be found first in the mode of arrangement of the branched and anastomosing connective tissue cells, and secondly, in the fact that the whole or nearly the whole of the matrix solidifies in a fibrillated form in the tendon, while in the areolar form of tissue, only a certain limited amount of fibrillization takes place upon the cells and their branches, leaving more or less roomy spaces (areolæ) between the anastomosing "bundles" thus produced.

(4.) The *matrix having solidified in either of the above methods may calcify from the deposit in it of lime salts*, as in the well-known process of ossification. The cells then become the *bone cells*, which repose in spaces or lacunæ which in the dried and polished slices of the tissue constitute the well known bone lacunæ.

Any of the tissues included in the above categories may undergo ossification, but the two tissues in which this is most frequent are the cartilages (development of bone from fœtal cartilage) and connective tissue (development of bone from periosteum, and in exceptional cases ossification of tendons, &c.). Even the mucous tissue may undergo ossification under favourable conditions (*e. g.*, the rare but authentic ossifications of the vitreous humour).

Such is a hasty survey of the modern conception of the connective tissue group, in which, with the exception of the development of the white fibrous matrix, Kölliker agrees perfectly with the more recent investigators. If now narrowing down our subject by the exclusion of bone, teeth, cartilage, and mucous tissue, we look for a moment exclusively at the typical tissue of the group connective tissue proper, we shall find that in the adult this tissue consists essentially of CELLS (connective tissue cells, connective tissue corpuscles of Virchow, cells of connective substance, plasm cells and tubes of Kölliker). These cells are small, nucleated, generally branched, more or less stellate, and anastomose by long processes, or tubes, so as to form a network; between them a solid matrix, translucent, granular, or fibrillated, exists to a greater or less extent. These cells, which are readily demonstrated after colouring them by the imbibition of carmine (though they may be seen without reagents under favourable circumstances), are the essential anatomical element of connective tissue, just as bone cells are the essential anatomical element of bone. The transformation of some of these cells into yellow elastic fibres, into pigment cells, or into adipose vesicles, the more or less complete fibrillization of the matrix, and its increase or diminution in quantity, its complete solidification or the formation in it of vacuoles of various sizes, these are circumstances which modify much the external aspect of the tissue in particular localities, and fit it to perform the special functions assigned to it in each; but everywhere, no matter what transformations some of the cells have undergone, a certain number of them continue to present the characters above described, and thus retain the typical anatomy of the tissue. And hence the anatomist, wherever he recognizes these elements, may affirm connective tissue to exist. Well-marked and beautifully anastomosing networks of such cells may be seen in thin sections of the brain and spinal cord, in the kidney, and in many other situations in which up to a very recent period the existence of connective tissue has been denied by respectable anatomists. Everywhere the *connective tissue cells* serve at least a *twofold purpose:* on the one hand, they serve to convey the nutritive juices into the little territories of tissue, that lie within the meshes of the smallest capillaries that carry red blood—on the other hand, as *they still retain the power of multiplying by division and producing broods of secondary cells under the influence of appropriate irritations*, they serve as the point of departure for the production of reparative material, and in virtue of the same set of nutritive laws acting under anomalous conditions may give birth to broods of cells, constituting the several so-called pathological new formations. If with this origin of the majority of pathological tissues, we bear in mind the fact that even in the physiological condition the tissues of the connective tissue group are mutually convertible (*e. g.* the transformation of cartilage and connective tissue into bone, and of bone into connective tissue in the formation of the marrow cavity of the long bones, &c.), we shall readily understand why it is that the vast majority of pathological new formations are either *evidently connective tissue*, as in cicatrices, fibroid and fibro-plastic growths, fibrillated lymph, &c. &c., *cellular elements rudimentary to the same*, typically developed or variously deformed and aborted, as corpuscular lymph, pus, sarcomata, tubercle, cancer; or finally *tissues of the connective tissue group* into which ordinary connective tissue is physiologically convertible, as cartilage, adipose tissue, bone, &c. &c.

We will dwell no longer on this subject, to which we have only alluded on account of its intimate connection with the modern doctrine of pathological new formations. The production of new formations out of connective tissue is not the whole sum and substance of pathological new formations; other tissues, especially the epithelia, may luxuriate into pathological growths, but yet connective tissue plays so large a role in the matter that it demands the most earnest attention. In conclusion, we commend the new volume of Kölliker to all our readers, as a safe guide to a knowledge of the minute anatomy of the tissues, and as presenting a closer approximation to the actual state of histological information than is to be found elsewhere in the English or any other language.

J. J. W.

BIBLIOGRAPHICAL NOTICES.

Art. XIV.—*Hand-book for the Military Surgeon: Being a Compendium of the Duties of the Medical Officer in the Field, the Sanitary Management of the Camp, the Preparation of Food, etc.; with Forms for the Requisitions for Supplies, Rations, etc.; the Diagnosis and Treatment of Camp Dysentery; and all the Important Points in War Surgery: including Gunshot Wounds, Amputation, Wounds of the Chest, Abdomen, Arteries, and Head, and the Use of Chloroform.* By Chas. S. Tripler, M. D., Surgeon United States Army. And George C. Blackman, M. D. F. R. M. S., Prof. of Surgery in the Med. Coll. of Ohio, &c. &c. Cincinnati: Robert Clarke & Co., 1861. 12mo. pp. 163, including Appendix of Forms.

A Manual of Military Surgery; or Hints on the Emergencies of Field, Camp, and Hospital Practice. Illustrated with Wood Cuts. By S. D. Gross, M. D., Prof. of Surg. in the Jefferson Med. Coll. of Phila. Philadelphia: J. B. Lippincott & Co., 1861. 24mo. pp. 186.

A Practical Treatise on Military Surgery. By Frank Hastings Hamilton, M. D., Late Surgeon 33d Reg. 4th Brigade 4th Div. N. Y. S. Artillery; Prof. of Military Surgery, &c. &c. New York: Baillière Brothers, 1861. 8vo. pp. 234, including Appendix and Index, with several wood-cuts.

The three small volumes, here announced in the order of their appearance from the press, will be regarded with unusual interest by the community at large; and it is to be hoped that they may attract the favourable attention of the medical profession generally. Many of the topics are of universal interest at all times, and only more important in time of war because of the imperative nature of its demands and demonstrations. Every member of our profession, in fact, is always, and now especially, more or less involved in the performance of some of the duties and the application of many of the precepts which are discussed by the able and patriotic authors of these little works.

These lessons in sanitary management and medical practice, no less than in dealing with the mischiefs of battle, are so essential to the saving of health and strength in ordinary life, that we hope to see an impression made upon the public mind in their behalf, and in support of medical authority, which nothing but the stimulus of present circumstances could bring about, and which may continue to afford some compensation for the trial now upon us, long after the ordeal that aroused it has been safely passed.

If there be any time when the value of true science and skill in medicine and surgery is properly acknowledged, it is in time of war. There can be no more uncompromising leveller of incompetence and charlatanism of every kind than the necessity of military service, where every step becomes a question of honour and dishonour, of life and death. So that in the medical corps, as in others, the really worthy officer may look forward in his career with a confidence that seldom falls to the lot of the practitioner in civil life; and as with individuals, so, of course, with the profession in a body. Every one is now disposed to admit the weight of the obligation which rests upon our calling, and in some measure to appreciate the effort which medical men are making, to maintain the vigour of the nation by doing what they can to protect and restore the health of its defenders, while they satisfy the cravings of humanity in warding off disease and palliating the effects of violence. Let us not forget, then, that the crisis of the day, however painful in many aspects, has this among other consolations, that it presents an opportunity, to prove the power and the good will of the medical fraternity of our country, which is at least as unexampled and as pregnant with consequences as the convulsion which produces it.

Under this view of the occasion, the appearance and character of these almost impromptu publications are very significant in many respects. They are encouraging as to the present spirit of our profession here, and full of promise in the future. Considering the short time allowed for the preparation of such text-books, and the many distracting influences at work throughout that interval, they are remarkably well adapted to their purpose, each in its peculiar way, and exhibit evidence of an ability to convey the required instruction, and of an alertness in imparting it, which is equally gratifying to our national and professional pride. Whatever may be the course and the event of the unhappy political contest, that share of the struggle to which these hurried offerings are addressed is, under the auspices of such beginnings, sure to end in permanent good.

We shall not pretend, in a brief notice of these works, to dwell upon the points of practice discussed in them; although some of the chapters are so interesting and important, especially in the "Hand-book" of Drs. Tripler and Blackman, that we hope to be able to consider them more at length on another occasion. For the present a very cursory glance at the leading characteristics of each volume will answer the purpose of inviting especial attention to them as indispensable monitors to the recently appointed surgeons and assistant surgeons, and as useful companions even to those of higher grade.

The first of the three is so fully described in its title that we may refer to this for the list of contents and for an idea of their nature. Of the ten chapters, the first six were the substance of the lectures on military surgery which Dr. Tripler had delivered for three years past in the Medical College of Ohio, at the invitation of Dr. Blackman. Three of these chapters had to be arranged by Dr. Blackman from unfinished notes left with him by Dr. T., who was summoned to headquarters before his revision of his labours was completed. Of the last four chapters, the sixth, seventh, and eighth, On Wounds of the Abdomen, Head, and Arteries, respectively, were compiled by Dr. Blackman, and one, the tenth, On the Use of Chloroform, was taken from the "Notes" of Mr. Macleod on the Surgery of the Crimean War.

In his first chapter, Dr. Tripler instructs the military medical officer in his routine duties in camp and field, as to the organization of field hospitals, modes of procuring supplies, and similar matters, in such a manner as to save him a great deal of time and trouble in acquiring an experience for which no previous knowledge could be an adequate substitute. Chapter II. is equally practical in its hints on military hygiene, including the inspection of recruits, the regulation of the diet and cooking, with tested recipes for food and drink, and the general management in camp and on the march. These two chapters are peculiarly valuable on account of the veteran practical experience on which they are evidently based. They are so clear and complete in themselves as to establish the high claims of the book without reference to the remaining chapters. Our only regret in relation to them is that the author had not the time to amplify and illustrate a little more in regard to sanitary matters and hospitals; and that he did not quote his own excellent instructions, already published under authority of the War Department, for the examination of recruits, instead of modestly referring to them only, along with those of Henderson. The duty of selection is so important, and has been hitherto so much neglected in mustering the volunteers, that definite regulations are absolutely indispensable, and might be introduced without materially increasing the bulk of a volume which is so portable as to be easily within the compass of the surgeon's pocket.

The next four chapters, on camp dysentery, gunshot wounds, amputations, and wounds of the chest, are admirable on each of these several topics. We have read them carefully through, and some portions of them repeatedly, with the greatest interest. They contain the best practical and theoretical view and condensed exposition of the various important questions involved, that we have met with in the same space in our language, and embody the results of a large amount of experience and a discriminating, candid, and able study of the most approved authorities, old as well as recent. We greatly like his views of the pathology and treatment of camp diarrhœa and dysentery, and would have been glad to find other diseases incident to military life noticed to some extent in the same practical manner. The bowel complaints of the soldier appear to resemble closely, in character, etiology, and susceptibility to certain modes of cure, those of the inmates of prisons and asylums, a considerable experience with which has long since convinced us of the propriety of his therapeutic management, especially in the resort to saline purgatives in the beginning of attacks of dysentery. He mentions the happy effect in chronic diarrhœa of small doses of Fowler's solution, and, in other cases, of the syrup of the perchloride of iron. He says nothing of the use of creasote in these attacks, a remedy which is of great value in certain forms of diarrhœa, as well as in cholera morbus, cholerine, and cholera. We cannot dwell upon the surgical topics discussed by Dr. Tripler, and must content ourselves with again remarking that these four chapters embody the most practically effective summaries of the kind that we know of in any work upon the subject.

Dr. Blackman has presented an excellent digest of the best authorities on wounds of the abdomen, head, and arteries, in which all that is essential is unusually well condensed, so as to constitute a very useful and worthy accompaniment to the labours of his associate. The chapter from McLeod on chloroform is valuable of course, but an exhibition of the American experience in the use of ether as well as of chloroform, including the views of Porter and others in Mexico and since, would have been much more satisfactory. It is especially in the use of anæsthetics in military surgery that we hope to gain more experience and perhaps make some approach to positive knowledge, in the observations of the future campaigns in this country. The appreciation of articular resections, and different modes of amputation, the treatment of gunshot fractures, and management of operations with regard to shock; the use of metallic and needle sutures, and the resort to acupressure; the employment of hyponarthecy or suspending apparatus, and the more efficient resort to extension and counter-extension in compound fractures; certain questions as to the treatment of arterial hemorrhage, and as to modes and materials of dressings, are some of the subjects of inquiry which we hope to see tested in the crucible of American experiment; but none of these is more important or more in need of elucidation than the determination of the respective merits and demerits and proper use of ether and chloroform as anæsthetic agents in field and hospital surgery.

The Handbook is furnished with an appendix of forty-two pages, consisting of the supply tables, forms for requisitions, accounts, returns, registers, prescription and diet book, muster-rolls, reports, and other similar documents, in which the mode and means of conducting the official business of the service are furnished in such a manner as to be within the comprehension and reach of every beginner. This must prove a valuable feature of the work to the volunteer surgeon. Being a thin duodecimo, the volume is very easily carried about the person; and with a light flexible cover, would be well worth keeping always at hand, as the best available guide for constant reference. The only fault we have to find is with the paper and printing, the former not being what it ought to be, and the latter being in too small a type. The probable early call for a new edition, however, will enable the publishers to remove these blemishes. With such an admirable basis it is to be hoped that the authors will have the time to extend the work itself, so as to contain their latest experience; and, at all events, to render their volume as complete a systematic instructor on all legitimate subjects as it is now a competent adviser on those which are most essential.

The manual of Dr. Gross is a neat little 24mo., well printed on good paper, and arranged in thirteen chapters, which contain a great variety of "hints on the emergencies of field, camp, and hospital practice." It is not easy to describe this work so as to give a clear idea of its scope and calibre; and we prefer taking the author's own account of it before going further. Its publication was the result of "an ardent desire to be useful to the young physicians who have so hurriedly entered the volunteer service, perhaps not always with a full knowledge of the weighty responsibilities of their position. It treats, very succinctly, of various matters not generally discussed, except in large and ponderous volumes, inaccessible in the camp and on the battle-field. It is essentially a book for emergencies; portable, easy of reference, always at hand."

The object of the indefatigable author will doubtless be fully realized in the usefulness of this smallest of his books, in the hands of many other young physicians besides those to whom it is expressly tendered, since it contains a large amount of practical information that must prove no less advantageous to the inexperienced practitioner in civil life than to the army tyro. Some of the hints, especially as to the materia medica and dietetics, struck us, in fact, as much better adapted to ordinary private practice than to that of the field and camp. Small as it is, Dr. Gross' volume includes a much wider range of topics than that of the Cincinnati authors; and hence, although necessarily very brief in its mode of treating many matters, and by no means uniform in dealing with those of equal practical importance, its great amount of information and numerous practical suggestions render it a valuable adjuvant to the larger manual. To at least some of our volunteer medical officers, therefore, we apprehend it must be deemed an essential one, and would recommend it strongly for that purpose, even to those who may not suspect their need of such assistance.

In regard to dressings, we are glad to find that Dr. Gross recommends the silver suture; not because we believe in any virtue of the silver, having become convinced by hundreds of trials that lead and iron are fully equal to the more expensive metal for the union of external wounds, but because the metallic suture will, or ought to, play a very important part hereafter in the dressing of wounds received in action. Spools of fine well-annealed iron and lead wire, and, if insisted on, silver wire, are as easily obtained and carried as silk, and may enable the surgeon and his patients to dispense with a large amount of adhesive plaster, vastly to the advantage of both parties, especially in tropical districts and seasons. Collodion has its use in some cases, and isinglass plaster is a very desirable succedaneum in a much larger number, particularly in warm weather; but the metallic suture, separate or continued, may be, and is often substituted with great success for all other means of union. The insect pin, with its twisted suture of thread or wire, is sometimes, and justly, preferred as a material improvement upon the separate metallic suture. It possesses advantages, when of the proper fineness and skilfully employed, which especially adapt it to campaigning surgery. It is to be regretted that, among the notes on hospital materials, nothing is said of the most convenient forms of the immovable apparatus in the dressing of fractures. The different combinations of calcined plaster with gum Arabic, starch, or dextrine, or with flour, may be easily provided, and would certainly prove invaluable in many cases. The same may be said of Dr. N. R. Smith's outline wire anterior splint, the various modifications of which are admirably adapted to the emergencies of military and naval surgery, as indeed to those of ordinary practice. With a coil of thick iron wire, or even with a lot of common iron hoops, an ingenious or well-trained dresser may furnish a supply of splints for upper and lower extremities, which would meet the exigencies of the service much better than the cumbrous and costly contrivances which are too apt to be employed.

Dr. Gross refers to a larger number of disorders than are noticed in the other volumes, but, like his competitors, he says nothing about heat-exhaustion and sunstroke, a source of casualty well known to the French and British armies, and already threatening to be a common one in ours, but not understood as it ought to be by inexperienced officers.

A brief enumeration of the subjects of the different chapters of the volume will give an idea of the variety of its material. The first two chapters are introductory, containing, among some twenty pages of general remarks, a list of leading works on military surgery. Then follow short chapters on the Qualifications and Duties of Military Surgeons; Medical Equipments; Stores and Hospitals; Wounds and other Injuries; Amputations and Resections—including some valuable statistics; Ill Consequences of Wounds and Operations; Injuries of the Head, Chest, and Abdomen; Diseases incident to Troops; Military Hygiene; Disqualifying Diseases; Feigned Diseases; Medical, Surgical, and Dietetic Formulæ; and, finally, an appendix containing a copy of regulations for the admission of physicians into the medical staff of the army, also a statement of the pay and emoluments of surgeons and assistant surgeons.

The work of Dr. Hamilton is on a larger scale, and is more of a library book than either of the others, being offered as a "Practical Treatise." It is evidently more elaborate in character, and as a systematic treatise by a professed lecturer upon the subject, has had the benefit of a somewhat longer period of incubation. It is more methodically arranged, and, on some topics, much more full, at the same time that questions of interest are considered which are untouched in either of the manuals. The young medical officer would do well, therefore, to provide himself with a copy of the treatise to accompany the other two. By cutting down the unnecessarily wide margins, and securing a flexible cover, with pocket and tucks, if desirable, he will obtain a very convenient as well as neat and useful remembrancer for the camp and post, if not the field.

There are fourteen chapters, a short appendix, and an index; the last four chapters being on Anæsthetics, and on Hospital Gangrene, by the author; on Dysentery, by Prof. A. Flint; and on Scurvy, by Prof. B. W. McCready.

Chapter I. is devoted, in twenty-seven pages of introductory matter, to various questions of general interest in regard to the nature, importance, and requirements of the study and the service to be discussed. The second chapter is a complete and very useful one on Examination of Recruits, which contains all that is needed on this important duty, including all that is essential from the authorized manual prepared by Dr. Tripler.

The remaining eight chapters treat respectively of General Hygiene of Troops; Bivouac, Accommodation of Troops in Tents, Barracks, Billets, Huts, &c.; Hospitals; Preparations for the Field; Hygienic Management of Troops upon the March; Conveyance of Sick and Wounded Soldiers; Gunshot Wounds: Amputation. Some of these chapters have the advantage of well executed illustrations, and are interesting, and, to some extent, novel; but we cannot help feeling a degree of disappointment at the meagreness of all of them, except, perhaps, the one on the examination of recruits; and even in that we should be glad to see some practical illustration of the injurious working of insufficient inspections, such as the records of the Mexican campaigns would certainly afford. We regret also to notice the omission of such topics as wounds of the chest, of the head and face, of the abdomen, of the bloodvessels, dressings and operations on the field, special management of fractures (splinter and gunshot) on the field and temporary post, and on the march; not to mention others which may occur to the reader perhaps when he most needs the absent information. Some of these topics are touched upon in the chapter on gunshot wounds, but not sufficiently. Others may not be regarded by the author as admissible under his rule excluding those points which are usually "considered in general treatises." As the work will be wanted to take the place, as far as practicable, of the general treatises, however, and as those topics are usually considered at length in works on military surgery, their absence will be very apt to be felt as a defect by those who may look to the work as a standard one. These shortcomings are doubtless the almost inevitable result of the necessary haste with which the volume was finally arranged and carried through the printer's hands; and we have no idea of finding fault with it, except as to its completeness as a "practical treatise," even upon the points alone intended to be taught. Well arranged, well written, interesting, instructive, and handsome, it certainly is; a more attractive and complete work than either of its competitors, also; and yet neither comprehensive nor full enough to enable us to do without the admirable practical expositions of the handbook, or the numerous hints on minor medicine and surgery of the manual. A thorough work upon the principles and practice of military surgery, such as is really wanted, or even an exclusively practical treatise on so extensive a subject, could hardly be condensed within the compass of two hundred and thirty pages, especially in the unprecedentedly short time that must have been allotted to the labour. The author is fully conscious of the difficulty, as is evinced by the apprehension which he expresses in his preface. That it will be amply done away with in a future edition prepared under more favourable circumstances, no one who knows anything of the ability, learning, and untiring industry of Dr. Hamilton can entertain a reasonable doubt.

In conclusion, we would earnestly advise every surgical aspirant, and every student of our profession, to provide himself with a copy of each of these volumes, as valuable assistants for which there are no available substitutes, and as curious way-marks of the progress of medical teaching in this country, as well as significant mementoes of a momentous passage in that country's history.

E. H.

ART. XV.—*Another Letter to a Young Physician: to which are appended some other Medical Papers.* By JAMES JACKSON, M.D., &c. 12mo., Boston, 1861.

WE have had great pleasure in reading this sequel to a volume which we noticed several years ago.[1] Indeed, upon all subjects within their competency, the judgments of men so sober-minded, impartial, kind-hearted, and accomplished as Dr. Jackson, are fitted to inspire respect and confidence. No one in the medical profession enjoys a higher reputation for sound reason and probity; and as he has now arrived at that ripe age when passion and prejudice have but little power to warp the judgment, whatever he may say upon a subject of interest is sure to command attention.

In the preface it is stated that "a grave question has been agitated" among the good people of Massachusetts by the delivery of Dr. O. W. Holmes' lecture on "Currents and Counter-Currents in Medical Science," and "the question is whether there is any good to be derived from the practice of medicine." Our readers will remember that the lecture in question was reviewed in this Journal,[2] and that throughout the profession a general feeling of regret was experienced that one so gifted as Dr. Holmes, and occupying so respectable an official position as he, should make use of language which the greater number felt to be a satire if not a libel upon the practice of medicine. The smaller number, and the better informed, remembered, however, that the author was an orator and a poet, and had had but little opportunity of acquiring that personal knowledge of practical medicine which would have lent authority to his judgment. It was only natural, they thought, that he should follow his most habitual bias, and for the sake of startling antitheses, quaint and novel metaphors, and pungent epigrams, should yield to the temptation of flouting the venerable art and science whose mysteries he professes to expound. Poets claim and receive a license not accorded to other men. They must speak as the spirit moves them; and if occasionally they utter vaticinations which, on the sober lips of science would be raving, they should be listened to with composure, and not answered in the same high-pitched key in which their tirade has been delivered. The soothing system is appropriate in this as in other cases marked by "the eye in a fine phrenzy rolling."

Some such idea, we fancy, was in the mind of Dr. Jackson when he resolved to compose this letter; for, starting from a seeming acquiescence in the spirit of the lecture, and suggesting that Dr. Holmes was misunderstood by those who regarded him as denying the utility of our art, he proceeds to state the question "whether the sick are more helped or hurt" by medicinal drugs? and then, after reminding us that some very eminent and very experienced physicians have been sceptical on the subject, he glides into a notice of the abuses in the employment of drugs and a eulogy of the sanative powers of Nature. Having paid this tribute to courtesy and kindness, he exposes the fallacy of reasoning and the more than extravagance of statement in Dr. Holmes' lecture, and concludes that its arguing for the disuse on account of the abuse of medicines is neither logical nor wise. Indeed, he is convinced that his friend, Dr. Holmes, is of the same opinion; but, as if to leave him no pretext for not being so, he proceeds to enumerate some of the more striking illustrations of the value of drugs in the treatment of disease. Of mercury, antimony, arsenic, cinchona, and opium, he has much to say that corroborates the settled judgment of the profession concerning their virtues, and as to the last he assures us that without it he would hardly be willing to practice medicine. Nor does he recommend these medicines in trifling doses. On the contrary, he recognizes circumstances which justify the prescription of mercurial preparations until the mouth is made sore; the emetic use of antimony at the commencement of typhoid fever is a method almost peculiar to himself, and one for which he claims very great value; he also advocates it in the forming stage of nearly all inflammations; ipecacuanha and squill he hardly subordinates to this potent remedy in appropriate cases, and adds that other medicines might be mentioned more or less similar to antimony, &c. Along with opium he classes conium, hyoscyamus, aconite, and the anæsthetics as having each its appropriate sphere of usefulness, and as to quinia, he is hardly behind the boldest of those who use it in heroic doses. As arsenic, he remarks, "has a bad character with many, I feel bound to testify that it is as mild and gentle in its effects on the human body as almost any efficient medicine ever employed by us." Iron he would not dispense with, nor bismuth, cascarilla, quassia, or cod-liver oil. Of cathartics, he remarks: "It would seem that we could hardly live without the use of cathartics—they are necessary;" and of depletion he is not afraid to make the unfashionable remark, that "the use of the lancet should not be altogether abandoned." On the contrary, he prescribes it in the thoracic inflammations even of young children, and in the forming stage of acute diseases generally. In acute rheumatism, indeed, he does not recommend it, but employs a still more active and perturbative agent, colchicum, requiring it to be repeated every four or six hours, until it brings on copious discharges. Guaiacum he lauds in the subacute form of this disease. "There are *many more* medicinal drugs, too good to be expunged from the list of the *materia medica*, which," says Dr. J., "I might mention. Among the more powerful of these are elaterium, digitalis, diluted hydrocyanic acid, and iodine:" and, among the milder drugs, "spirit of nitric ether, the compound spirit of ether, the solution of acetate of ammonia, valerian, and assafœtida, old friends, whom I would not like to part with. The same may be said of mustard, the water of ammonia, croton oil, chloroform, and cantharides, for external use."

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[1] Jan. 1856, p. 136.

[2] Oct. 1860, p. 462.

And this is a specimen of the materia medica of a physician who appears as the ally and champion of the witty orator who, after securing opium, "a few specifics which our art did not discover, and it is hardly needed to apply,"(!) with wine and anæsthesia, would have us throw into the sea all the rest "of the materia medica as now used," if he were not restrained by a charitable regard for the health of the fishes! Well might Dr. Holmes exclaim "*non tali auxilio nec defensoribus istis!*" But well may we rejoice that in his own calm yet authoritative way, Dr. Jackson should have furnished so perfect an antidote to the inconsiderate and incorrect estimate placed by his colleague upon medicine. Even more we must be gratified to find so able an advocate of the energetic treatment of disease at a time when many among us allow themselves to be ruled by the popular prejudice which an absurd medical heresy has engendered, and are tempted to withhold the active remedies, whose virtues were demonstrated centuries before globulism was invented, and barren scepticism, or mere *fainéantise*, was dignified with the name of scientific expectation.

An appendix to the principal essay in this volume contains several interesting articles in the form of notes. The first is an account of an attack of cholera infantum, which the distinguished founder of the Lowell Institute suffered in his infancy, and which would certainly have nipped in its bud the life of this child of promise, had not Dr. Jackson, having no fear of sceptical doctors or opinionated laymen before his eyes, treated the case with small doses of calomel and castor oil, like a sensible and orthodox physician. Indeed, we are not quite sure that this treatment, which is now so generally approved, did not originate with him. Dr. Clark, of Dublin, and Dr. Cheyne, of Leith, however, used it about the same time. The case of Mr. Prescott, the historian, forms the subject of another note. It is full of interest. Its special relation to the principal topic of the work consists in the fact that for the relief of a violent inflammation of the eye, which turned out to be rheumatic, more than seven pounds of blood were drawn in the course of five days, besides which the patient "was purged abundantly, was blistered freely, was kept in the dark, and on the lowest diet; also the vessels of the conjunctiva were divided twice." If Dr. Jackson had been a pupil and imitator of Dr. Rush, whom he is disposed to blame for his heroic system of therapeutics, he could not more strikingly have illustrated his own faith in the efficacy of vigorous and prompt treatment on a proper occasion.

In the concluding paper, Dr. Jackson presents a critical history of the disease of which Washington died. He defends the treatment employed by the great man's physicians, which consisted of bloodletting, calomel and antimony, and warmly reprehends the opinion that inaction would have been warranted by an ignorance of the real nature of the attack. His opinion of its precise character Dr. Jackson does not expressly declare, but contents himself with naming it acute laryngitis. He, however, describes the œdematous as one of its anatomical forms, and as that which probably terminated Washington's life. In all probability such an attack occurring in so robust a patient as was this illustrious man, would at the present day be cured by the operation of tracheotomy, a remedial measure which, as well as many other heroic modes of treatment, is not likely to be abandoned because cobweb-brained theorists abjure common sense, and witty poets make merry at the expense of the sober realities of medical practice. A. S.

ART. XVI.—*Reports of American Institutions for the Insane.*

1. *Of the State Hospital of Pennsylvania, for the year* 1860.
2. *Of the Western Pennsylvania Hospital, for the year* 1860.
3. *Of the Mt. Hope Institution, for the year* 1860.
4. *Of the Eastern Kentucky Asylum, for the fiscal year* 1859–60.
5. *Of the Central Ohio Asylum, for the fiscal year* 1859–60.
6. *Of the Southern Ohio Asylum, for the fiscal year* 1859–60.
7. *Of the Indiana Hospital, for the fiscal year* 1859–60.
8. *Of the Illinois State Hospital, for the fiscal years* 1858–59 *and* 1859–60.

1. COMING once more to our accustomed review of the reports annually issued from the American Institutions for the Insane, the first which we find upon the list is that of the *State Lunatic Hospital of Pennsylvania.* It contains the numerical results of the medical history of the year just closed; and we copy from them such as are of the greatest importance.

	Men.	Women.	Total.
Patients in hospital, December 31, 1859	149	125	274
Admitted in course of the year	73	71	144
Whole number	222	196	418
Discharged, including deaths	69	58	127
Remaining, December 31, 1860	153	138	291
Of those discharged, there were cured	14	17	31
Died	6	2	8
Admitted, from opening of hospital	777	559	1336
Discharged, cured	136	100	236
Died	112	66	178

Died, in 1860, from exhaustion of chronic mania, 4; exhaustion of acute mania, 2; suicide, 2. In neither of the cases of suicide was any suspicion entertained of a propensity to self-destruction.

Exhibitions of pictures with the magic lantern, and lectures upon various subjects have been continued, as for several preceding years, as entertaining, instructive, and curative means.

"The great want," says Dr. Curwen, "which is more and more sensibly felt, is more general variety of occupation and agreeable diversion during the period from October to April, which shall place in the reach of the officers the means of giving to each inmate regular, systematic bodily exercise, and at the same time call into play the energies of the mind, and give such employment to its powers as may tend to drive off morbid fancies and aid in the re-establishment of healthy action.

"The bowling saloon, for the erection of which Miss Dix, ever forward in every good work, placed in my hands three hundred dollars, from the Philadelphia fund, has been completed, and I have no doubt will be the means of healthful exercise and agreeable recreation to a very large portion of our household, present and prospective. The building has been arranged so as to be as light and cheerful as it could be made, and, with two alleys, ample means are offered for as much physical exercise as may be proper and healthful."

Several pages of the report are occupied by an exposition of "a few principles which may lay the foundation for a more distinct understanding of what may be said on the prevention of insanity." We commend these observations to the attention of the profession, and, would our space permit, we should be pleased to quote them in full.

2. The report for 1860 of the *Western Pennsylvania Hospital* affords gratifying evidences of the present flourishing condition of that institution, as well as the pledges of its prospective growth. The report is embellished not only with a picture of the building now occupied, but also with a beautiful perspective view and a ground-plan of the far more extensive one which has been commenced, for the accommodation of the insane patients of the hospital, a few miles from the city of Pittsburg. The central edifice of this establishment, and a wing upon either side, the whole presenting a front of about 270 feet, are already "under roof." Another purchase of land has been made, so that the Hospital farm now consists of about 280 acres. All the measures thus far taken indicate an intention on the part of the persons who have charge of the institution, to make it, at no very distant day, a fit peer for the best of its kind in the country. This new establishment has been named the "DIXMONT HOSPITAL FOR THE INSANE," as a grateful token of the sense entertained by the Board of Managers for the philanthropic labours of Miss Dorothy L. Dix.

	Men.	Women.	Total.
Patients in the hospital, January 1, 1860	61	39	100
Admitted in course of the year	56	53	109
Whole number	117	92	209
Discharged, including deaths	58	40	98
Remaining, January 1, 1861	59	52	111
Of those discharged, there were cured	29	17	46
Died	5	5	10
Admitted since opening, April 1, 1856	265	176	441
Discharged, cured	107	58	165
Died	31	12	43

Died, in 1860, of apoplexy, 2; of consumption, 2; exhaustion of acute mania, 2; chronic diarrhœa, 1; cancer of stomach, 1; general paralysis, 1; dropsy, 1.

"For the amusement as well as the occupation of our patients, we have availed ourselves of every means within our reach—such as reading, games, and concerts; but we are satisfied that they are entirely too limited. The money invested in the erection of a bowling alley, the purchase of a magic lantern, and other sources of amusement, would prove a judicious investment, giving its return in an increased per centage of cures, as well as affording a pleasant pastime to the secluded members of our household."

It is greatly to be regretted that, after all the exertions for the amelioration of the condition of the insane during the last thirty years, no better statement than the following can be made of the condition of things in a State which has been one of the most active in the benevolent enterprise alluded to. Will not Pennsylvania redeem her character in this respect?

"We fear the condition of the insane poor throughout the State is but little understood, and that the impression produced by the memorial to the Legislature by Miss Dix, the indefatigable friend of the insane, revealing the wretchedness and suffering endured by this class of citizens, a few years since, and resulting in the erection of hospitals for their care, has not been permanent in the deeper recesses of jails and poor-houses, and that the same sad condition of things exists as before.

"The many statements that are made to us of cruelties which the insane are compelled to bear, at the hands of their friends and relatives, of one confined in a strong wooden cage, of another chained in a dark room, of another severely whipped as a method of cure, lead us to believe that the instances of cruelties and neglect at the hands of unpaid and reluctant keepers, are not few, particularly when we have witnessed recently in a receptacle for the insane, five men chained to the floor, manacled and entirely destitute of clothing, with no beds but bags of straw, and no light but that which struggled into their gloomy abodes through the iron gratings in the doors, their cells filthy in the extreme, and the atmosphere unfit to breathe. In adjoining rooms we found the quiet harmless female, the raving maniac, who made night hideous with his yells and clanking chains, and the simple idiot child—and all under the care of an imbecile keeper.

"When we see patients brought to the hospital securely tied with ropes, or heavily ironed, and bearing upon their persons marks of violence, and know that others, who, while here, enjoyed entire freedom from personal restraint, have been removed through motives of economy, and are manacled and chained to the floor of their cells, we cannot but hope that the day will soon come when a more enlightened public sentiment will be directed to these evils and apply the proper remedy."

3. From the report for 1860 of the *Mt. Hope Institution*, we learn that a part of one wing of the *Mt. Hope Retreat*, the new establishment of the institution in question, has been completed and is already occupied by patients. The two will continue to be occupied until the latter shall have been completed.

	Men.	Women.	Total.
Insane patients at beginning of the year	71	106	177
Admitted in the course of the year	71	64	135
Whole number	142	170	312
Discharged, including deaths	70	55	125
Remaining at the end of the year	72	115	187
Of those discharged, there were cured	30	23	53
Died	11	5	16

Causes of death.—General paralysis, 5; phthisis pulmonalis, 2; acute mania, 3; exhaustive mania, or febrile delirium, 3; organic disease of heart, and dropsy, 1; rupture of aneurism of the aorta, 1; gastric ulcer, with hæmatemesis, 1.

The system of moral treatment at this institution embraces "musical parties," "social reunions," and "reading parties." "On Christmas day, about one hundred female patients partook of their usual entertainment in the large parlour, which was fitted up with evergreens appropriate to the occasion." The 4th of July was observed by festive parties in the groves belonging to the institution.

It would appear, from the subjoined extract, taken from the remarks upon the different forms of disease among the patients of the last year, that the theories of other men, most of them persons of little or no experience in mental disorders, have not, in the mind of Dr. Stokes, overcome the effects of observation in regard to one alleged form of disease.

"To the variety of mental derangement styled *moral insanity*, *eight* cases belong. In the individuals comprehended in this class, we have presented those unfortunate specimens of humanity whose characters having grown and been modelled after a certain abnormal type, the impossibility of a reformation, in all its utter hopelessness, has become apparent. No amount of discipline, no efforts to mould again the disposition, propensities, and passions now avail; and, because they render themselves insupportable in their families, and are turbulent in their conduct, and erratic in their habits, they are necessarily banished from society and shorn of their civil and political rights."

Another class of cases are thus noticed:—

"*Suicidal propensity* was exhibited in *twelve* cases. This form of insanity is much less frequently observed among persons carrying on occupations out of doors, than among artisans who pursue their employment within doors, and take little muscular exercise. Statistics fully show that suicide is not so often committed by masons, carpenters, and butchers, as by tailors, shoemakers, and bakers. A similar result is obtained by comparing the suicides in the class of *labourers* with those among *artisans* and *tradespeople*; for the tendency to suicide is more than twice as great among artisans as it is among labourers. The disadvantages under which the sedentary artisan labours in this respect may be greatly mitigated. The workshops of all artisans admit of immense improvements in ventilation. Opportunities and facilities for out of door exercise should be afforded. Public walks and parks would afford the artisan an opportunity of refreshing his exhausted limbs, and respiring the fresh air; and the health and temper of the sedentary workman would be much ameliorated by affording facilities in towns for athletic exercises and simple games out of doors, which, while they bring the muscles into play, unbend, excite, and exhilarate the mind."

4. We are happy to chronicle the fact, that in the course of the past year, "one hundred and thirty acres of excellent land" have been added to the heretofore limited domain of the *Eastern Kentucky Lunatic Asylum*. "We now have ample means," says Dr. Chipley, "of giving healthful employment to those whose previous habits make labour a necessity; and sufficient extent of grounds to afford agreeable exercise and recreation to all the inmates of the Asylum, without the necessity of resorting, as heretofore, to the highways and grounds of the adjacent country." * * * * "I am more than ever convinced," he continues, "that well regulated moderate labour is one of the most efficient agents in the restoration of the curable, and that it is absolutely essential to the comfort and happiness of a large portion of those who are doomed to pass their whole lives without the rational world. I have men daily employed in agricultural and other pursuits who would be rendered furious and intractable by a single week's close confinement. I consider the profit derived from lunatic labour as of secondary importance; it is proper to make them self-supporting, as far as may be consistent with their interest; but the great object of restoration, where this is possible, should never be lost sight of; and, failing in this, humanity demands such measures as are calculated to afford bodily health and all the comfort and happiness the insane are capable of enjoying. This twofold object is kept steadily in view in all the labour assigned to the inmates of this institution; and if any pecuniary profit results, it is hailed only as an incidental advantage. During my administration of six years no one has ever inflicted any injury on his fellows, either in the field or shops."

	Men.	Women.	Total.
Patients in the asylum, October 1, 1859	130	98	228
Admitted in course of the year	33	17	50
Whole number	163	115	278
Discharged, including deaths	29	17	46
Remaining, October 1, 1860	134	98	232
Of those discharged, there were cured	14	9	23
Died	4	6	10
Whole number of patients, from 1824	1625	814	2439
Recovered			905
Died			936

Causes of death the past year.—General paralysis, 2; maniacal exhaustion, 2; hypertrophy of heart, 2; phthisis, 3; cancer of the breast, 1.

We have never had the pleasure of visiting the institution the report of which is before us. It is among the six or seven oldest establishments for the insane in the United States. Its original construction was very defective; its early management apparently such as might be based upon the proposition to furnish custodial arrangements at the cheapest possible rate. Under these circumstances it is gratifying to find that Dr. Chipley, in addressing the Board of Managers, can now hold the following language:—

"To you, gentlemen, I am indebted for your countenance and support in every effort I have made to elevate the character and to increase the comforts and usefulness of the institution. It has been an arduous and protracted struggle; but I am happy now to have it to say that under your management, and the fostering care of generous legislation, the hospital has reached a point where it may safely challenge comparison with any of the many excellent institutions in our country. Many of them have more magnificent buildings, but none of them enjoy more of the substantial and essential comforts and blessings afforded by such institutions."

5. The records of the *Central Ohio Lunatic Asylum* furnish the following items for the last fiscal year:—

	Men.	Women.	Total.
Patients in the asylum, November 1, 1859	111	103	214
Admitted in course of the year	98	110	208
Whole number	209	213	422
Discharged, including deaths	86	84	170
Remaining, November 1, 1860	123	129	252
Of those discharged, there were cured	54	47	101
Died	7	7	14

The diseases terminating fatally are not mentioned, and the numerous tables of statistics formerly included in the report from this institution are all omitted.

It is stated that, in the course of the past year, mechanical means of bodily restraint has been used in but one instance, and that was "in a surgical case, confining a patient to a chair for short periods, on account of very sore feet."

During the colder half of the year, one evening in each week is devoted to a lecture, generally illustrated by the magic lantern, and another evening to dancing. The lectures are delivered by Dr. D. L. Ely, the senior assistant physician.

6. The report from the *Southern Ohio Lunatic Asylum* is brief, and contains but little which would be interesting to the readers of the Journal. The professional matter is restricted almost exclusively to the usual numerical tables.

	Men.	Women.	Total.
Patients at the beginning of the year	83	73	156
Admitted in course of the year	60	67	127
Whole number	143	140	283
Discharged, including deaths	61	65	126
Remaining, November 1, 1860	82	75	157
Of those discharged, there were cured	37	27	64
Died	6	2	8

"The number of books has been considerably increased during the past year. The reading room and library now form quite an attractive place of resort for many of the patients."

Dr. McIlhenny recommends an enlargement of the building, on the ground that the present accommodations are inadequate to the necessities of the people of that district of the State which is allotted to this institution.

7. The principal numerical results at the *Indiana Hospital for the Insane*, for the fiscal year ending October 31, 1860, are as follows:—

	Men.	Women.	Total.
Patients at the beginning of the year	149	154	303
Admitted in course of the year	111	110	221
Whole number	260	264	524
Discharged, including deaths	108	119	227
Remaining at the end of the year	152	145	297
Of those discharged, there were cured	49	55	104
Died	19	10	29
Admitted, from opening of hospital, 1848	994	980	1974
Discharged recovered	459	464	923
Died			147

Died, the past year, from maniacal exhaustion, 5; phthisis pulmonalis, 4; apoplexy, 2; suicide, 2; tabes mesenterica, 2; disease of heart, paralysis, œsophagitis, and "empyema," 1 each.

"The general health of the patients and employees has been unusually good. The sanitary and police regulations of the hospital have been strictly insisted upon, and to this steady adherence may be attributed much of the success of the institution. Timely medication may very materially assist the physician in the restoration of insane patients, but without due regard being constantly had to all those laws of health involved in sleeping, dieting, and the exercise of the physical powers, medicine might as well be dispensed with, and the invalid left to the efforts of nature."

The library was enlarged, in the course of the year, by means of a legislative appropriation.

Dr. Athon calls the attention of the General Assembly to the fact that, as epileptics are not admitted into the asylum, no provision for their treatment has been made by the government of the commonwealth. He advises the introduction of gas for lighting the apartments, and again urges the enlargement of the building.

Aside from the numerical tables, this report is almost wholly devoted to the finances and the *materiel* of the institution.

8. From the report of the *Illinois State Hospital for the Insane*, it appears that the buildings of that institution are wholly inadequate to the demand for accommodations. Although a general knowledge of the crowded condition of the hospital existed, yet the applications were threefold the ability to admit. The extension of the buildings which was in progress at the time of the last preceding report, "was arrested when midway toward completion," and "the completed portions (of that extension) have for two years been kept vacant." The cause of this action, or, rather, cessation of action, is not mentioned.

	Men.	Women.	Total.
Patients in the hospital, December 1, 1858 .			229
Admitted in the course of two years . . .	174	149	323
Whole number			552
Discharged, including deaths			321
Remaining, December 1, 1860			231
Of those discharged, there were cured . .			154
Died			29

Causes of death.—Exhaustion from long continued mania, 10; exhaustion of acute mania, 6; consumption, 6; typhoid fever, 6; epilepsy, angina pectoris, ulcer, and suicide, 1 each.

"As usual, the great proportion of deaths has been from that natural termination of insanity, which, for want of any distinct appellation, is termed 'maniacal exhaustion.' It is subject of frequent remark that the insane in our institutions are less liable to physical disease of acute character than any other given number of individuals. This is only true as it regards fevers and diseases of a purely inflammatory character. The regularity of diet and habits of repose, and the evenness of temperature secured by steam heating, are unquestionably favourable to the prevention of acute disease. Within the last six months, the first striking exception to this rule has occurred known in our experience. In the month of June last, cases of typhoid fever began to make their appearance in the western, or female division of the hospital. Gradually becoming more marked, in the number as well as violence of the cases, it reached its highest degree of intensity in the month of August, when about twenty individuals, including several of the officers and attendants, were at one time prostrated by it. During the course of the epidemic, about thirty cases occurred, three of which proved fatal. Considering that our whole household numbered nearly three hundred individuals, in the most imminent state of exposure, and with constitution especially open to the reception of the virus, we may regard ten per cent. of cases, and one per cent. of deaths, a small tribute to this sometimes remorseless visitant. This favourable result was solely due to the prompt isolation of the affected cases, happily made very complete in the wards of the unoccupied wing. Those who died were all subjects of incurable mental disease. It is suggestive that all these cases but four were in one division of the institution; and, of the four exceptions, two were officers brought into contiguity with the sick in the discharge of their duties. It seemed to be clearly contagious, as proven by several curious facts shown in the course of the epidemic. It was unquestionably caused by the mephitic exhalations from the subterranean sewers which drain the division to which it thus especially confined itself."

We rarely meet with three consecutive sentences containing three truths of so great importance as those of the subjoined paragraph.

"We believe that success, in the treatment of the insane, largely depends on the ability to engage every mind in some sort of employment or recreation. The doctrine that insanity, even when unconnected with palpable physical disease, is to be treated by the appliances of the apothecary's art merely, belongs to a bygone age. Hence, no means is to be despised that will draw any mind from its morbid contemplations."

It is not to be doubted that the system of moral treatment pursued at this institution is as liberal and comprehensive as the funds or means devoted to that object will permit. After alluding to the employment furnished to the patients on the farm and garden, in the dairy, the kitchen, the laundry, the bakery, and the carpenter's shop, Dr. McFarland proceeds as follows:—

"In the winter season, mattress making and mat braiding, both involving considerable labour in the preparation of material, are excellent methods of engaging the attention of many who would otherwise find the time hang heavily. For indoor amusement, books, newspapers, games of chance and skill, with an occasional social reunion, at which large numbers of the insane, of both sexes, with their attendants, join for a few hours in temperate festivities, are all relied upon, and each commends itself to some especial class. Yet, after enumerating all the ordinary recreations in use to while away the monotony of hospital life, the list would be radically deficient if no mention was made of what is, after all, the most unfailing of all entertainments—the mutual attrition of minds so abounding in angularities and eccentricities that thought assumes shapes grotesque enough to amuse the gravest auditory. No one can be long in an institution for the insane without perceiving that the influence of insane persons upon one another is generally good, notwithstanding excitements among them are to a degree contagious.

"Some of the most salutary influences have been proved to have arisen from the contemplation by one insane person of another in a still worse condition. But the most striking of these mutual influences is produced by the entrance of some new-comer, who brings into the common social stock some accomplishment of novel kind, or some new 'sensation' idea, by which he can make himself conspicuous. The gentleman who could utter vocal sounds from his throat nearly resembling the strains of an Æolian harp was for some months as good as an ever-present instrument of agreeable music. One gentleman, of fine education and much general intelligence, with a singular mental activity, has kept those about him for months together on the high wave of interest at a scheme for founding 'the Republic of Pomona in the South Orkney Islands.' From the first conception of this plan to its present complete development, every department of art and science in any way contingent to it has been discussed with a thoroughness that has been quite exhaustive. The disquisitions pronounced upon geography, navigation, purveyance, political economy, municipal government, and state religion, would have done no discredit to the author of the New Atlantis. These spontaneous sources of interest are sometimes better than any set entertainment." * * * *

"Among the agreeable incidents of the past two years we place prominently a visit from Miss D. L. Dix, in the summer of 1859. The spirit which actuated this philanthropic lady in setting on foot the measures which led to the establishment of this institution was, on this late occasion, found to be still as active as ever. Appealing in person to the liberality of those benevolent citizens in whom this community happily abounds, a fund of several hundred dollars was raised and placed in the hands of a committee, which, having been remitted to her, resulted in the purchase of a library of about 250 volumes, some fine stereoscopes, and a large collection of engravings, which, being framed at the institution, are scattered, with liberal profusion, about the patients' wards and sleeping rooms."

It will be recollected that, on former occasions, the subject of the treatment of insane prisoners in the ordinary hospitals has been pretty fully discussed, and the arguments of several medical superintendents against the practice presented. Dr. McFarland here gives his views, closing in the following language:—

"As all are liable to the sad visitation of insanity—the person of refined and sensitive nature as well as others—and as the radical principle of all insane hospital treatment is that of regulated association of numbers together, this subject cries loudly for the aid of the philanthropic legislator. Now, while the penitentiary at Joliet is in process of construction, is the time when this reproach should be taken away from this institution. Every prison, of course, has its infirmary, and it only needs the attachment of some rooms of greater strength to give such cases of insanity as may arise comfortable accommodation. Then, the repeal of any act authorizing the transfer of such cases would forever remedy the evil. Either this must be done, or the ends of justice and the designs of philanthropy must continue to be infringed.

"The subject reduces itself to the plain question: '*Which is the more proper, to have a hospital attached to a penitentiary, or to have a penitentiary attached to a hospital?*' The former is a necessity in all instances, a humane juxtaposition, which should never be wanting: the latter is a needless incongruity, corrupting to the whole employed corps of the hospital, and, if suffered to continue, would surely be eventually regarded as a reproach upon the ruling sentiment of the State."

We perceive in this report an error in the estimation of the net value of the productions of the farm, such as we have heretofore noticed in several of the reports of similar institutions. Among the items of those productions are, corn $1931, hay $1225, and milk $4672. Now it is to be presumed that a large part of the corn and hay were *expended in the production of the milk.* Hence the value of all that was so expended is reckoned twice, making the profit or income too large by the amount of that value. P. E.

ART. XVII.—*Microscopic Anatomy of the Lumbar Enlargement of the Spinal Cord.* By J. DEAN, M. D., communicated to the Amer. Acad. of Arts and Sciences, by Prof. J. WYMAN, Nov. 14, 1860. Cambridge, 1861: pp. 21, quarto, with 4 plates.

THE substance of this very creditable memoir will readily be gathered from the following conclusions at which the author arrives:—

"1. That true nerve cells exist only in the gray substance, these cells being connected by their processes in more or less definite groups; but not probably, as some authors maintain, so as to form an uninterrupted chain from brain to *filum terminale.*

"2. That the anterior roots arise partly from nerve cells, another portion being directly continuous with the posterior roots. A part of the posterior roots also enter cells.

"3. The roots may therefore be divided into three classes: 'such a division does not, however, imply any functional difference.'

"(1.) Anterior and posterior roots which arise from or terminate in anterior or posterior cells.

"(2.) Anterior and posterior roots which meet in cells near the central part of the gray substance.

"(3.) Anterior and posterior roots which are directly continuous.

"4. That bundles of anterior roots are connected with those above and below, by looped fibres proceeding from cells which some of the roots enter; these fibres leaving the gray substance, and passing sometimes upwards, sometimes downwards through the anterior columns, finally curving inwards to join some other bundle of anterior roots with which they pass into the gray substance.

"5. That thus fibres from nerve cells, after passing upwards through the longitudinal white columns, do not *all* continue onwards to the brain, but most of them re-enter the gray substance at a greater or less distance from the point of exit, sometimes probably becoming again connected with cells, and again emerging from these as longitudinal fibres.

"6. That the processes from a single nerve cell, whether in the anterior or posterior cornu, do not necessarily *all* pass into the *same* bundle of roots, but often pass into three or four different bundles; a cell process also sometimes sending branches into different bundles. Thus we may have sensitive impressions from different parts of the surface conveyed to one cell, and motor impulses distributed from one cell to different points.

"7. That all the anterior and probably all the posterior roots enter the gray substance, though the posterior roots often pass into the cornu at a considerable distance from their first entrance into the cord.

"8. That most of the fibres from the posterior roots, after traversing the posterior columns, are collected into transverse bundles, traversing the *substantia gelatinosa* in a slightly ascending course, after passing through which they curve downwards (sometimes upwards), forming, by the longitudinal course which they then maintain for some distance, a very interesting series of longitudinal bundles, which I have called *longitudinal columns of the cornua*, standing in a very close relation to the *posterior vesicular columns* of Clarke, with the cell processes of which many of their fibres are continuous.

"9. That some of the bundles which traverse the *substantia gelatinosa* do not pass into the *longitudinal columns of the cornua*, but proceed directly across the gray substance, becoming continuous with the anterior roots.

"10. That the posterior white columns are composed almost entirely of the posterior roots, which merely traverse them before entering into the gray substance. They appear, however, to receive a few fibres from cells situated on the extreme margin of the posterior cornua, and some more or less longitudinal fibres from the looped recurrent bundles.

"11. That the posterior roots are connected by curved fibres or bundles of fibres, proceeding from one root and curving round after penetrating the gray substance, becoming connected with some other root above or below. The same is seen in transverse sections with regard to roots situated side by side, both anterior and posterior, the looping fibres sometimes proceeding directly from root to root, and sometimes passing through cells.

"From which it results that the same fibre must in different parts of its course conduct both centrifugally and centripetally.

"12. That, besides the looped recurrent fibres, the three principal courses taken by the posterior roots before entering the gray substance are with reference to a longitudinal plane, ascending oblique, descending oblique, and transverse."

We have thus presented Dr. Dean's conclusions, embodying as they do the gist of his paper. We cannot go into the elaborate task of discussing them in this place, and showing how far they agree with the opinions of other investigators, and in what they differ from them, though in a general way we may remark, they agree best with the opinions of J. S. Clarke.

Suffice it to say that the paper is the evidence of an honest attempt to work out a most difficult problem, of the highest physiological importance. And that if, after its perusal, we are still compelled to regard the course of the nerve fibres in the spinal cord, and their relations to the nerve cells, as among the unsettled problems, which minute anatomy has as yet incompletely answered, we do so with a full appreciation of the value of Dr. Dean's effort, and with the hope that he will persevere in the difficult and honourable investigation upon which he has made, what every one who knows by experience the difficulties of the subject must regard as a most creditable and praiseworthy beginning. As a matter of some interest we subjoin in full the mode of preparation employed by him in the studies.

"The method of preparation usually employed was a modification of Gerlach's and Clarke's, although many others were employed, according to the object in view. The following method gave the best result from which to make drawings. Thin sections from the cord, hardened in alcohol, were washed a few minutes in pure water, and then immersed in glycerine to which Gerlach's solution of carmine,[1] previously filtered, had been added; in this the sections were allowed to remain 4 or 8 hours, according to the tint desired (a light tint interfering least with the details and sharpness of outline). I have been able to obtain more delicately coloured specimens, and more clearly defined structure by the use of glycerine than by any other method. The sections are then washed first in pure water, afterwards in strong alcohol, in which they are allowed to remain about an hour, and are now ready for preparation with turpentine, according to Clarke's method; they may be put up in Canada balsam, or, as I have found very advantageous, in thick colourless copal varnish, which often preserves minute details better than balsam; although Stilling and others have found much fault with Clarke's method of preparation, on account of the too great transparency it sometimes gives, I am convinced that, with practice and some slight modifications, it is the only one suited to the minute study of the cord, other methods seeming to me, after thorough trial, quite unsatisfactory as compared with Clarke's. As a hardening material, I have often employed chronic acid with considerable advantage; but when colouring matter is used, alcohol is most suitable, and is certainly much easier to succeed with."

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[1] Solution of carmine in water, to which a few drops of strong ammonia have been added.

In conclusion we may bestow praise on the four plates which illustrate the memoir, and which we are told were etched upon the copper by the author himself. They are evidently faithful likenesses of the preparations from which they are drawn, which more than counterbalances any little want of artistic elegance in their execution. J. J. W.

Art. XVIII.—*Researches upon the Venom of the Rattlesnake; with an Investigation of the Anatomy and Physiology of the Organs Concerned.* By S. Weir Mitchell, M. D., Lecturer on Physiology in the Philadelphia Medical Association. Published by the Smithsonian Institution, January, 1861. Pp. 145. With twelve wood-cuts.

The industry, perseverance, and experimental skill displayed in this monograph reflect much credit upon the author. From the preface we learn that "during a large part of two years he has given to this work almost all the leisure which could be spared from the everyday exactions of his regular professional duties."

The essay is divided into seven chapters. The first contains some general observations upon the habits of the Crotalus when in captivity. In the second is described the anatomy of the venom apparatus. The third treats of the physiological mechanism of the bite of the Crotalus. The fourth is devoted to the consideration of the physical and chemical characters of the venom. In the fifth, sixth, and seventh chapters, the toxicology of the venom of the Crotalus is considered. Chapter eighth treats of Crotalus poisoning in man.

The last four chapters more particularly commend themselves to the practitioner of medicine, who is occasionally called upon to treat cases of rattlesnake bite and its dreadful constitutional effects.

From his numerous experiments upon different animals, Dr. Mitchell concludes—

"1st. That the heart becomes enfeebled shortly after the bite. This is due to direct influence of the venom on this organ, and not to the precedent loss of the respiratory function. Notwithstanding the diminution of cardiac power, the heart is usually in motion after the lungs cease to act, and its tissues remain for a time locally irritable. The paralysis of the heart is, therefore, not so complete as it is under the influence of upas or corroval.

"2d. That in warm-blooded animals artificial respiration lengthens the life of the heart, but does not sustain it so long as when the animal has died by woorara or decapitation.

"3d. That in the frog the heart-acts continue after respiration has ceased, and sometimes survive until the sensory nerves and the nerve-centres are dead, the motor nerves alone remaining irritable.

"4th. That in warm-blooded animals respiration ceases, owing to paralysis of the nerve-centres.

"5th. That the sensory nerves, and the centres of nerve power in the medulla spinalis and medulla oblongata, lose their vitality before the efferent or motor nerves become affected.

"6th. That the muscular system retains its irritability in the cold-blooded animals, acutely poisoned, for a considerable time after death.

"7th. That the first effect of the venom being to depress the vital energy of the heart, and nerve-centres, a resort to stimulants is clearly indicated, as the only rational mode of early constitutional treatment."

With regard to the condition of the blood in cases of Crotalus poisoning, the author informs us "that in animals which survive the poisoning for a time, the blood is so altered as to render the fibrin incoagulable. Experiments in and out of the body have given proof that this change is gradual, and that the absence of coagulation is not due to checked formation of fibrin, but to alterations produced by the action of the venom in that fibrin which already exists in the circulating blood. The influence thus exerted is of a putrefactive nature, and imitates in a few hours the ordinary results of days of change. It is probably even more rapid within the body, on account of the higher temperature of the economy. The altered blood retains its power to absorb gases, and thus to change its own color. The blood-corpuscles are unaffected in acute poisoning by Crotalus venom, and are rarely and doubtfully altered in the most prolonged cases which result fatally. The contents of the blood-globules of the guinea-pig can be made to crystallize, as is usual after other modes of death."

Concerning the antidotes to be employed, or the mode of treatment to be instituted for the purpose of counteracting the deadly effects of the rattlesnake venom, Dr. Mitchell's researches afford us no satisfactory information. After criticizing and throwing doubt upon the efficacy of the various remedies from time to time recommended for the cure of Crotalus poisoning, he says:—

"When a person has been bitten, it would be proper slightly to intoxicate him, then to loosen the previously applied ligature or cup, and, watching the pulse, and relaxing or tightening the ligating cord, to control thus the inlet of the poison, with the aid of the stimulus destroy its effects in detail. Finally, the stimulus should be most cautiously and by degrees abandoned, with continued regard to the state of the system."

"It sometimes happens," he continues, "that the physician finds it impossible to produce stimulation in the presence of so potent a sedative as the venom. When this is the case, it is possible that absorption does not occur with sufficient rapidity, or, at all events, that cases may occur where it is necessary to stimulate fully and suddenly.

"Under these circumstances, I would recommend inhalation of the fumes of warm alcohol, or even of ether, if used with caution.

"While advocating the employment of stimuli as rational therapeutic means of meeting a most obvious indication, it is proper to admit that cases have been and will be encountered, in which the dose of venom has been so great that no remedy is of any avail. Such, however, must be rare, and it is, on the whole, more than probable that the danger from the bite of the rattlesnake has been over-estimated, and that in a large majority of cases the patient would recover, even if unassisted by any remedy.

"Where stimulants are of any use, the patient commonly recovers without any difficulty. In some cases, however, which attain to the stage of alteration in the blood, we have to deal with conditions which are also present in other cases of putrefactive poisoning, but for which we have no remedies of well-determined power. Possibly, tonics, astringents, and continued stimulation might be of some value in supporting the strength until the blood recovers its normal condition."

A copious bibliographical record of the subject, derived chiefly from Soubeiran's Bibliography, is appended to the "Researches." Another appendix contains "An Enumeration of the Genera and Species of Rattlesnake, with Synonymy and References," by Mr. E. D. Cope. J. A. M.

Art. XIX.—*A Treatise on the Practice of Medicine.* By Edwin R. Maxon, M. D., Formerly Lecturer on Institutes and Practice of Medicine in the Geneva Medical College. 8vo. pp. 705. Philadelphia: Lindsay & Blakiston, 1861.

A careful perusal of this work has impressed us with strong doubts as to Dr. Maxon having acted very wisely in acceding to the solicitations of the members of his class for the publication of the present volume. He seems to us to have mistaken his vocation when he undertook to write a treatise on the practice of medicine. The avowed design of the author is to produce as original a work as one of the kind can well be rendered. In this we cannot think that he has succeeded, and, so far as we are able to discover, the treatise supplies no existing want in our native medical literature. In neither the accuracy and fulness of its pathological and therapeutical teachings, the extent and value of the personal observations and deductions embraced in it, nor the excellence and clearness of its style can it compete with the practical systematic treatises already in our possession. Nor can it rank with these simply in the character of a useful additional exponent of the theory and art of healing, which, while it carries its readers over the same ground, directs their attention to points of interest which others have, perchance, but imperfectly explored, or invests with a new interest and importance, some which already have become familiar.

It cannot be recommended as a safe and useful guide for the student, still less as a work of reference from which the busy practitioner, on an occasion of emergency, can derive the information he may want; in both of which characters, however, it is offered by its author.

The treatise of Dr. Maxon is strictly and almost exclusively dogmatic. The author but rarely condescends to examine and attempt to reconcile any apparent contradiction which may exist in the observations upon record bearing upon the pathology or treatment of particular diseases. The simple assertion "it seems to me," he would appear to deem sufficient for the settlement of all difficulties, and to establish as truths whatever views he propounds in reference to the causes, seat, and nature of diseased action—whatever plan he lays down for its modification or arrest.

The great defect in the work before us, whether as a manual to supply the wants of the medical student, or as a remembrancer of the leading facts and principles of the theory and practice of medicine for the use of the physician, is not so much, perhaps, in the erroneous teachings, generally speaking, of the author, as in their extremely superficial and incomplete character. Some of the most important and intricate questions connected with the causation, character, and management of certain of the morbid conditions to which the human organism is liable—questions that have occupied much of the attention of medical observers, and in reference to which a vast amount of facts and observations have been accumulated—are passed over without the slightest notice, or are examined in so concise a manner that the reader is left without any accurate idea of the real state of our knowledge in respect to them; while others, again, involving wide differences of opinion among some of the most erudite and experienced members of our profession, are treated with a dogmatism that is only excusable in reference to what are universally recognized as established truths. Further, the style of the work is as deficient in precision and elegance as it is in accuracy, and is throughout disfigured by grammatical blunders. As an excuse for the defects of style, Dr. Maxon pleads want of leisure for their correction. A plea very rarely valid, and altogether inadmissible where the author, as in the case before us, is under no necessity of publishing before he is fully prepared to execute his task in a proper manner.

In conclusion, we regret to have to add that though the volume is handsomely got up in respect to its mechanical execution, it is full of errors of the press, many of them being of a particularly annoying character.

D. F. C.

ART. XX.—*Report of Professor Valentine Mott's Surgical Cliniques in the University of New York, Session* 1859-60. By SAMUEL W. FRANCIS, Member of Dr. Mott's Surgical Staff. S. S. & W. Wood, 1860: 12mo. pp. 204.

THE object of this exceedingly well printed and elegantly got up little volume, we are told in the preface, is "to preserve in a durable shape some of the aphorisms of one whose experience is as vast in the practice of surgery as his reputation is great in the eyes of his countrymen." It contains a report by the author of the remarks made by Professor Valentine Mott upon some ninety cases, which presented themselves at his surgical clinique in the course of a winter.

Well drawn up reports of the clinical lectures of eminent medical men form not only a very instructive, but a very interesting and agreeable portion of the literature of our profession, and judging from the number of such reports published both in separate volumes and in medical periodicals, it is, moreover, a portion of our literature which is very highly appreciated.

The reputation of Dr. Mott is great, not only "in the eyes of his countrymen," but everywhere where great surgical achievements are known and honoured, and his clinical lectures, being the result of extensive experience, will no doubt be read with very considerable interest, both in this country and abroad.

We regret, however, to have to say that this work is disfigured by very numerous typographical errors and by peculiarities of style, which, by a reasonable degree of care on the part of the editor, would have been readily avoided. For instance, we read: "mercury had been administered together with a few general hygienic rules;" "stimulants must be freely given and plenty of fresh air, together with the proper hygienic principles of therapeutics." "The boy's health began rapidly to decline, and his parents apprehending a prolonged dissolution." "The slow, torturing, exsiccating, gnawing pains of a cancer." "When a cicatrix has resulted in what the French term 'contracteur.'" "Why cancer should always affect the lower lip. and Hare lip likewise with as certain accuracy involve the upper lip, are paradoxes that must be classed among the unexplained phenomena." "Caries of the vertebræ are." "When caries of the spine have been." "Five days before New Years last;" gluetei muscles, sinovitis, lucoma, epiphasis, etc. etc. The prescriptions are also most carelessly written. We read: Aquæ Bulient.; Extr. Hyosiami; Melis; Tinct. ferri iodidi; Hydrarg. Sub. Muriat; Liquor Potassa et arsenit.; &c. &c. One of them, to give a specimen entire, is as follows: ℞.; Quinin. Super Sulphat. ʒj.; Aromat. Sulphur. Acet. ʒij.; Zinzer. Syrup. ℥vij.; M.

Surely errors such as these are altogether inexcusable. W. F. A.

ART. XXI.—*Guy's Hospital Reports.* Edited by SAMUEL WILKS, M.D., and ALFRED POLAND. Third Series, Vol. VI. London: 1860. 8vo. pp. 531.

THE present volume of this valuable publication contains seventeen original communications, one wood-cut, and nine lithographic plates. The following is an analysis of its contents:—

I. *On the Surgical Diseases and Injuries of the Nose, Larynx, Thorax, with its contents, and of the Organs of Circulation.* By THOMAS BRYANT.

In the last volume of *Reports* Mr. Bryant published the first of a series of articles, intended to illustrate, from cases that have occurred in Guy's Hospital, the surgery of the different regions of the body. That article, upon the injuries and diseases of the nervous system, was very satisfactory.

In the present paper, under the head of *diseases and injuries of the nose,* Mr. Bryant speaks only of foreign bodies in the nose, of polypi, and of ozæna. For the removal of foreign bodies, we are told to place the patient, who is generally a child, under the influence of chloroform, and to use a hook-bent probe, or a pair of forceps. No mention is made of the application of a pinch of snuff, or of black pepper, a proceeding much less terrifying to the child, and one that often succeeds, by the paroxysm of sneezing produced, in dislodging the obstructing body.

For the removal of the softer kinds of polypi, Mr. Bryant, in common with almost all surgeons, prefers abruption, which he performs by means of a noose of wire instead of a pair of forceps. In regard to the firmer and fibrous forms of polypi, he says that they appear to grow from the upper and posterior portion of the nasal cavity; if they grow forward, the nose may be slit up and the growth removed, either by excision, ligature, or both; if they press backwards down the pharynx, means adapted to the requirements of the case, calculated to procure a like end, must be employed; the soft palate may require division, but such a practice should not be performed unless absolutely essential. The anatomical origin of these fibrous polypi, and the methods by which they require to be attacked, are not by any means well set forth in this description. Almost invariably these fibrous polypi, projecting into the nasal passages from their meeting in that direction with least resistance to their growth, spring from the anterior surface of the basilary process; they are in fact vegetating periosteum, enormous hypertrophy of the fibrous membrane covering that portion of the base of the cranium. To thoroughly eradicate them it is necessary, as we have several times witnessed ourselves, not only to divide the soft palate, as Mr. Bryant says, but to remove the whole bony palate, or, what some surgeons prefer, to remove an upper maxillary bone. For *malignant* polypi we are advised to pursue a like treatment to that recommended in the fibrous; no other account of them is given. For chronic inflammation and thickening of the mucous membrane of the nose, particularly that portion covering the inferior turbinated bone, which sometimes is mistaken for polypus, constitutional treatment, in the form of tonics, is advised, as being generally all that is required. Removal of the turbinated bone Mr. Bryant would hesitate to practise. Constitutional remedies, however, are, we know, not always sufficient to relieve the patient; and the removal of *a portion* of the lower turbinated bone, for which the ordinary scissors of a pocket-case are all that is required, should then be practised.

The offensive smell of the discharge from the nose in *ozœna*, Mr. Bryant believes to be owing entirely to decomposition of the retained muco-purulent secretion, and that the free use of a syringe is all that is requisite to rid the patient of that most troublesome symptom. Cleanliness locally, with tonics constitutionally, comprise his treatment; topical stimulants, such as the sulphate or chloride of zinc, or the nitrate of silver, in the strength of about one grain to the ounce of water, are employed when simpler means have failed.

Eighty examples of *foreign bodies in the air-passages* are given. Five of the cases were three years old and under, and three between the eighth and ninth year. In all tracheotomy was performed; in five, the foreign body was ejected immediately upon the opening of the trachea, and all of these cases recovered but one that died on the eighth day of broncho-pneumonia. In the three cases where the foreign body could not be removed death ensued, the foreign bodies in those cases being a bean, a piece of bone, and a nut-shell. Several practical points are presented from the consideration of these cases; if the body is soft and likely to become swollen and enlarged, or pointed and rough so as to irritate the bronchial membrane, the operation should be at once performed; if the body refuses to move, after an opening has been made in the windpipe, the opening should not be closed, in order that the body may be ejected, should it become displaced by some fortunate act of coughing; and the third point is to examine the larynx carefully by passing a probe upwards through the wound, and the finger downwards through the mouth. The fatal result in two of the cases seems very evidently to have been the result of the neglect of the second and third points just mentioned.

Œdema of the larynx from swallowing boiling water is another condition quite often requiring tracheotomy in England. The poor in that country have the habit of feeding their children out of a teapot, and the children in consequence not unfrequently go to the kettle on the fire to get a drink of their food. Œdematous inflammation of the pharynx and orifice of the larynx is the result. Mr. Bryant cites twelve examples of such an accident, all taking place in children under three and a half years of age. In nine cases tracheotomy was performed; in five of these with success, in the remaining four a fatal result ensued. In regard to scarifying the œdematous mucous membrane, Mr. Bryant says that it has lately been suggested by surgeons, but that he has no personal experience to give upon the matter; adding, moreover, that if it can be done with facility and success, the propriety of such a measure cannot be doubted.

A frequent cause of death in all the cases of tracheotomy related by Mr. Bryant, both those in which the operation was performed on account of the inflammation produced by a scald and those where it was performed to facilitate the extraction of a foreign body, was broncho-pneumonia. One cause aiding considerably in producing this affection, he says, is the irritation of the milk or other food which finds its way into the air-passages on account of the imperfect closure of the orifice of the larynx. To remedy this he proposes to feed the child through a tube passed down into the œsophagus. All that is necessary in these cases, however, is to administer semi-solid food, such as thickened soups and pounded meat, and to withdraw all liquids as much as possible, for these alone find their way down the orifice of the larynx. A principal cause of the broncho-pneumonia observed after tracheotomy, and one not referred to by Mr. Bryant, is the external air passing directly into the trachea, without having been previously warmed by passing through the nose, mouth and fauces. The use of the *cravat* recommended by Trousseau, a large woollen comforter loosely fastened around the throat, is calculated to produce a good effect, and should always be practised. A point worthy of remark in regard to the situation of foreign bodies that have entered the bronchi is, that Mr. Bryant states the *left* bronchus to be their most common seat. This is at variance not only with the anatomy of the parts, but also the almost uniform experience of surgeons.

Of *wounds of the throat* thirty-six instances are given; in fourteen, the nature of the injury inflicted being severe. In their treatment, Mr. Bryant does not, as many surgeons, reject entirely the use of sutures, but declares them to be of immense benefit in large wounds, where the parts cannot be kept together. In following his plan, too much care cannot be taken to allow a *free passage* for the blood, the mucus, and the various secretions, and for the ingress of air.

Of *simple fracture of the ribs*, Mr. Bryant possesses one hundred and eight examples. The plan of treatment he recommends, and which is the one usually employed at Guy's Hospital, is the application of long strips of thick plaster, about one and a half to two inches broad and long enough to extend from the spinal column to the sternum, each strip when applied overlying the one above for half its width. By this means, he says, the injured ribs are kept absolutely at rest, whilst those of the sound side are left free. The use of adhesive plaster presents many advantages, in these cases, but we have always believed it necessary to encircle the whole chest; those we use are long enough to go once and a half around the body. On account of the influence which the recent publication of Dr. Hamilton will necessarily have on the practice pursued in this country in the treatment of fracture, we would here express our regret at his having objected to the use of adhesive plaster in these cases, giving for his reason that it will certainly become loosened after a few hours by the slight but uninterrupted play of the ribs. It is not only the best bandage for the patient, but also the one most readily and easily applied by the surgeon.

When injury has been done to the lung so extensive as to cause not only emphysema, but pulmonary hemorrhage, the treatment pursued by Mr. Bryant consists in the administration of antimony and in bleeding freely once, twice, or three times if necessary. In regard to the benefit to be derived from bleeding in these cases, his testimony is very strong; although so opposed are they generally to bleeding, in Guy's Hospital, that he states it to be more rare there than any capital operation.

In conjunction with these cases of fracture of the ribs with injury to the lung, Mr. Bryant relates a very curious case where, by the passage of the wheel of a cart over the trunk of a boy, seven years of age, the lower edge of the middle lobe of the right lung was lacerated to the extent of three inches, and yet there was no fracture of the ribs, or any external indication of injury to the thorax. The possibility of laceration of the lung, without fracture of the rib, is a point worthy of remembrance.

Under the head of *diseases and injuries of the organs of circulation*, Mr. Bryant treats of wounds of the arteries, of aneurism, and of nævus. Among the cases recorded of *wounds of the arteries*, are three of punctured wounds of the femoral, and in one of these spontaneous cure resulted. There is of course always room for doubt as to whether the femoral has been really wounded, but in this instance, at all events, the evidence is, for us, quite sufficiently strong. Of lacerated wounds there are three examples, one of the axillary from a fall on the spike of an iron railing, and two of the popliteal, associated with and caused by dislocation of the knee-joint. In the laceration of the axillary there was no bleeding, and there was also a total absence of pulsation in any of the vessels of the arm. A pad was placed over the wound, and the arm kept at rest; no bad symptom followed, and after five weeks he left the hospital cured, pulsation in the radial having returned, but none in the brachial artery. In both the cases of laceration of the popliteal artery, the dangers were much magnified by the injury received by the knee-joint. In both amputation of the thigh was performed, and both died from sinking, one a few hours, the other forty, after the operation.

Of *aneurism*, Mr. Bryant possesses twenty examples, fifteen of which were of the femoral artery in some portion of its course. The chief point of interest in these cases, at the present moment, is the result of the effort to cure them by means of pressure, in those cases where pressure was applicable. In eight cases of popliteal aneurism, pressure was tried; three of them were cured, and five were afterwards successfully treated by ligature. In two cases of aneurism, situated about Hunter's canal, pressure was successful in one; in the other it was given up, after a short trial, for the ligature, which was successful. The reason given for abandoning pressure in all these cases is, that it was intolerable to the patient. The manner in which the pressure was applied is not carefully described; a lead weight and a screw tourniquet were used; that is all we are given to know. In only one case was digital pressure made use of, and in that case it was successful, all pulsation ceasing at the expiration of sixty hours, after the clamp and weight had been used without apparent advantage for five weeks. We feel persuaded ourselves that, by a greater exertion of patience, and, above all, of ingenuity in the application of pressure, a greater proportion of the cases would have been successfully cured by this means.

The practice recommended by Mr. Bryant, in the treatment of *nævi*, is that now generally adopted by surgeons. Caustics for the purely cutaneous; the ligature, the seton, or injections of perchloride of iron for simple subcutaneous; and the ligature or excision for those in which both the subcutaneous tissue and the skin are involved. His experience with the injection of perchloride of iron is not very satisfactory. Of twelve cases, a successful result ensued in seven—that is to say, the nævus became indurated, and apparently in an inactive condition. In one case suppuration followed, and in four the whole tumour sloughed off, the inflammation excited by the injection having been too intense.

Of wounds and diseases of the veins Dr. Bryant does not speak in this paper, for the reason, we hope, that he may enter more fully into their consideration in a future article. The table of admissions into Guy's Hospital shows a large number of cases of wounds of veins, of ruptured varicose veins, of local phlebitis, and of thrombus.

II. *Catena of Cases illustrating the Use of Forceps in Extraction of Cataract.* By John F. France.

This communication contains the histories of twenty-one cases of cataract in which the operation of extraction was performed. Of these twenty-one cases, nineteen were successful.

Much of his success Mr. France attributes to the use of artery-forceps to control the globe of the eye, during the operation, in the manner described in a former paper, published in vol. iv. of the *Reports*, an abstract of which was given in the April number of this Journal for 1859. Desmarres, who introduced the use of artery-forceps for this purpose, declares that he has abandoned them for instruments *mieux supportés* by the patient. The thimble he describes. or the hook of Pamard, must be decidedly less disagreeable to the patient, and equally advantageous.[1]

This communication is accompanied by a plate containing two figures, representing, one the mode in which M. Desmarres used the forceps, the other the mode in which they are used by Mr. France.

III. *On some Diseases of Children.* By SAMUEL WILKS, M.D.

In the present article Dr. Wilks has brought together a large number of cases of the following diseases: *Tubercular meningitis*, *tubercular disease of the brain-substance*, *simple acute meningitis*, *simple arachnitis*, *convulsions*, *chronic hydrocephalus*, *secondary ventricular effusion*, *simple ventricular effusion from anæmia*, and of *hydatids in the brain*; of *croup* and *laryngeal affections*, and of cases generally in which *tracheotomy* is performed, in order to show the dangers of that operation; of *pneumonia*, *bronchitis*, *pericarditis*, etc.; of *cancrum oris*, and of cases to show the cause of death from *burns* and *scalds*. Of these various affections, fatal cases, in which *post-mortem* examination was made, have been selected by Dr. Wilks, so that his paper is particularly valuable, as giving their anatomical peculiarities, and as pointing out in what direction their fatal termination may be looked for.

This communication, one of the most valuable in the whole volume, is of a kind scarcely admitting of analysis. The opinions therein expressed in regard to the various affections treated upon are founded upon cases that are recorded in great detail, and derive their importance chiefly from this connection. To give an analysis of all these cases is out of the question; all that can be done is to state the more important opinions to which the study of these cases has obliged Dr. Wilks to come, and some few general conclusions.

Tubercular meningitis, which some writers do not distinguish from acute meningitis, he believes may be shown to be as distinct an affection as any in the nosology; so also acute simple meningitis, and acute arachnitis arising from external causes. Two facts, that seem now to be clearly ascertained in pathology, are well indicated by these cases, namely, that *convulsions* are dependent on the affection of the surface of the brain, and paralysis on softening of the central part.

In cases of cerebral affection, the contracted condition of the abdomen, associated with a similar contraction of intestine and constipation, and the very general dislike to being disturbed, are points to which attention is particularly called. Pains in the limbs and increased sensibility of surface are also often observed.

In regard to croup, Dr. Wilks believes that the membranous and the catarrhal forms are identical affections, the membranous exudation being due, not so much to any pathological peculiarity of the disease as to the anatomical structure of the air-tubes in children, and that this form of exudation need not of necessity occur, though the disposition exists always to its formation. In regard to tracheotomy in connection with the treatment of croup, Dr. Wilks does not give a decided opinion from the absence of sufficient data. As it is often spoken of as a harmless operation, it may be well to add that he declares that he believes it to be an operation of considerable hazard, and one not to be put in practice without deliberate reason for its necessity. He points out a source of danger in tracheotomy which we have never before seen alluded to, namely, pneumothorax arising from the escape of air from the mediastinum drawn into the chest from the neck. In two cases he records, the emphysema was confined to the chest; in a third it was universal.

IV. *The Physiology of Sleep.* By ARTHUR E. DURHAM.

From experiments made upon dogs and rabbits, Mr. Durham is led to believe that during sleep the brain is in a comparatively bloodless condition; and moreover that the blood in the encephalic vessels circulates with diminished rapidity. His experiments were made by removing, by means of a trephine, a portion of bone about as large as a shilling from the parietal region, partially cutting away the subjacent dura mater, and replacing the bone removed by an accurately fitting watch-glass, fastened air-tight by inspissated Canada balsam. The results of observations thus made, as recorded by Mr. Durham, are altogether at variance with the doctrine almost universally taught by physiologists, that sleep is accompanied by sanguineous congestion of the brain. From its manifest bearing upon the point in question, it may be thought a matter of some surprise as well as regret, that Mr. Durham did not think of examining the condition of the fontanelles of infants during sleeping and waking. The degree of projection or depression of the soft parts covering these natural orifices in the cranium affords a good indication, we believe, of the vascular condition of the brain. At all events, other experiments and further observations are necessary before physiologists will be willing to receive his doctrine.

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[1] Traité Théorique et Pratique des Maladies des Yeux, tome iii. p. 183. Paris, 1858.

After summarily announcing the result of his experiments, Mr. Durham proceeds to argue as if the bloodless condition of the brain during sleep was an accepted fact, and to endeavour to show how this condition would be produced by causes which, he maintains, are favourable to sleep. To give an example: a hearty meal, a substantial supper, he says, is favourable to sound. deep sleep. and the reason is that during the digestive process the abdominal viscera receive a vastly increased supply of blood, leaving the rest of the body comparatively empty. Now, going to bed upon a full stomach gives one but a sorry chance for a quiet rest in the night; *ut sis nocte levis, sit tibi cœna brevis* is an old saying and a true one. Again, during the digestive process we have no doubt that the blood circulates more rapidly over the whole body, and the bloodvessels everywhere are fuller. One of the aphorisms of Hippocrates is that in winter and in spring the abdominal viscera are naturally very warm, and the sleep very long (αἱ κοιλιαι χειμῶνοσ καί ἦροσ θερμόταται ύσει, καὶ ὕπνοι μακρότατοι). The long sleep, according to Mr. Darwin's doctrine, would be the *result* of the warmth of the viscera, for this would be owing to the great quantity of blood in the abdomen, leaving, as a matter of course, the rest of the body, with the brain, comparatively healthy. This warmth about the belly was much sought after in ancient days, before, however, the reason of the connection it has with sleep was explained: it is good, on going to bed, says an old writer, "to lie on the right side first, because at that site the liver doth rest under the stomach, not molesting any way, but heating him as a fire doth a kettle that is put to it." This old explanation of the effect of position upon sleep seems very absurd to us: undoubtedly some of Mr. Durham's explanations will produce the same effect upon the minds of medical men in future years.

The condition of the mind has more to do with sleep than the condition of the digestive organs. We read that when Ptolemy, king of Egypt, had posed the seventy interpreters in order, and asked the nineteenth man what would make one sleep quietly in the night, he told him, "*optimum de cœlestibus et honestis meditari, et ea facere.*" At the present day we could not make a better answer, and so practical a one is not to be drawn from the long communication before us.

V. *Some Cases of Hydatid Disease.* By S. O. Habershon, M. D.

The cases reported by Dr. Habershon are thirteen in number. In ten the liver was affected, in one the cellular tissue of the bladder, in one the pericardium, and in one case the hydatid cyst was situated between the stomach and the colon. In only one of the ten cases in which the liver was affected was any operation performed for the relief of the patient; in this case the contents of the hydatid cyst were evacuated by repeated operations with a trocar, and the patients recovered.

VI. *Facts and Fallacies connected with the Research for Arsenic and Antimony; with suggestions for a method of separating these Poisons from Organic Matter.* By Alfred S. Taylor, M. D., F. R. S.

The method for the detection of arsenic herein recommended by Dr. Taylor, he believes to combine the advantages of the two tests of Marsh and Reinsch, and to be attended with less risk of fallacy than either process taken separately.

Marsh's process for the research for arsenic consists, as is well known, in the conversion of the ordinary compounds of arsenic to arseniuretted hydrogen gas, in a properly constructed apparatus. By its means, according to experiments made by Dr. Taylor, deposits may be obtained from the 2000th part of a grain of arsenic, in the minimum quantity of liquid required for use in Marsh's tube. When the weight of arsenic reaches the 1-100th of a grain, the deposits admit of the application of corroborative tests. In using this process, however, for the separation of arsenic from the fluids or solids of the body, two difficulties are encountered. First, there is no good or simple method of bringing the arsenic to a concentrated state, that is, to a state fitted for testing without producing froth; and, secondly, when the quantity of arsenic in an organic liquid is so small as to render the adoption of the process necessary, it is not possible to follow the plan of the inventor, of generating the hydrogen in the whole quantity of the organic liquid.

The process of Reinsch is singularly simple, delicate, and easy of application. It is founded upon the fact, accidentally discovered by him, that when a piece of copper is immersed in a mixture of hydrochloric acid and water, if arsenic be present, it will be deposited on the surface of the metal. The 1-4000th part of a grain of arsenious acid thus admits of detection. Antimony is precipitated upon copper under precisely similar circumstances; the presence of twice the quantity, or the 1-2000th part of a grain, is, however, necessary. Compared with the method of Marsh, for the purpose of revealing the presence of antimony, Reinsch's method is twenty times more delicate.

In this paper Dr. Taylor calls attention to the fact that there is no kind of copper available for use in Reinsch's test, that is free from arsenic. The presence and influence of this impurity in a medico-legal analysis may be of the highest importance, and the facts which have been ascertained by Dr. Taylor, and which he has published in this communication, are such as should be known to all who may be called upon to make such an analysis.

The plan which Dr. Taylor recommends for the separation and detection of arsenic in liquids and solids, whether organic or inorganic, is based, 1st, on the ready conversion of arsenic into *chloride;* 2d, the transformation of this compound to *hydride* by Marsh's process; 3d, the production of metallic arsenic, of arsenious and arsenic acid from the hydride; and 4th, testing the products.

The whole of this communication is certainly of the highest importance in a medico-legal point of view.

VII. *Additional Notes on Diabetic Cataract.* By JOHN F. FRANCE.

This communication is made for the purpose of giving a concise *resumé* of all that is known and that has been hitherto published upon the connection between diabetes and cataract, to which Mr. France was the first to call particular attention in the *Ophthalmic Hospital Reports* for January, 1859. All the examples he has collected, twenty-one in number, rest on the authority of living English authors.

The description he gives of the characters displayed by diabetic cataract is as follows:—

"The cataracts have in every example been symmetrically developed on both sides; the lenses have increased remarkably in their antero-posterior diameter, so as to encroach upon the depth of the anterior chamber, and even to interfere mechanically with the free play of the iris. The opacity has attacked portions of the several strata of the crystalline at once, leaving intermediate spaces for a while transparent. The colour and bulk of the cataracts have invariably indicated their soft consistence, which was proved by operation in two persons, though respectively of 'middle' and of forty-eight years of age. Lastly, the ocular affection has only arisen after considerable duration of the renal malady (a circumstance which may tend in some degree to account for the comparative rarity of their union); and there has, in no case, been reason to suspect further disease of the eyeball."

From the novelty, as well as the importance of the subject, we would call attention to the fact that Desmarres, in the work we have already cited, vol. iii. p. 522, has an article upon defective vision caused by diabetes. All diabetic patients, he says, complain of weakness of sight; they become very near-sighted, and some are troubled with *muscæ volitantes*. He gives the ophthalmoscopic appearances in two cases, which we will relate, as Mr. France states there was in no case of diabetes reason to suspect further disease of the eye. In these cases Desmarres found very marked disturbance in the vitreous humour; ecchymoses in the retina, some recent, others old and having undergone absorption; and disturbance in the secretion of the pigmentum, forming what has been called *maceration* of the pigmentum.

At the conclusion of this communication mention is made of the facts discovered by Dr. Mitchell in regard to the influence of sugar in causing the development of lenticular cataract, published in this Journal for January, 1860.

VIII. *Remarks on two Cases of Extra-Uterine Fœtation.* By J. Braxton Hicks, M. D.

This communication gives a complete history of two cases of extra-uterine fœtation, one tubal, the other synthetical, presenting some points of pathological and physiological interest. In both cases the parts were examined immediately after removal from the body, before they had been immersed in spirit, which interferes with correct microscopical examination.

It is a vexed question whether the decidua-like membrane, found in nearly every instance lining the uterus in these abnormal conceptions, is really the decidua; and whether the decidua-like membrane surrounding the ovum in its new cell, in some cases, is a true decidua; and if so, a production of the ovum. On the occasion of a paper contributed by Dr. Robert Lee to the *Medico-Chirurgical Transactions*, vol. xli., in the abstract given in this Journal for July, 1859, we gave our reasons for believing that the results of Dr. Lee's examinations were by no means satisfactory, and that more favourable specimens would show that, contrary to his doctrine, no true decidua was formed around the ovum outside of the uterine cavity. In the cases reported in the present paper, the opportunities for making minute examination were most favourable, and the conclusions arrived at were that there was no trace of a decidua, or anything like it in function or appearance, on the termination of the villi of the chorion.

It should be added that within the uterus a decidua-like membrane was found lining the cavity, in microscopical structure and in vascularity essentially the same as *true* decidua.

This communication is illustrated by two lithographic plates, containing numerous figures.

IX. *On Rupture of the Popliteal Artery and Popliteal Aneurism.* By Alfred Poland.

The communication is one of very considerable length, extending over one hundred and sixteen pages. It contains cases collected from all sources of rupture of the popliteal artery, or of an aneurismal sac in connection with the popliteal artery, without any lesion of the integument. There are 9 cases of complete rupture of the artery, 19 of incomplete, and 42 of ruptured popliteal aneurism, in all 70 cases. The history of each case is given in detail, and in introducing the cases of other surgeons, as recorded in the public journals, the remarks accompanying each are appended. We can do no more than give a brief *resumé* of the treatment adopted, and of the results obtained in these cases.

Of 6 cases in which no operation was performed 2 recovered, one after spontaneous amputation below the knee, and 4 died.

Of 4 cases in which compression was employed, 2 died from the bursting of the tumour externally, and 2 recovered. It must be added, that in a large number of cases compression was had recourse to for several days, but had to be abandoned as ineffectual, the swelling continuing to increase.

Of 6 cases in which the popliteal space was laid open by incision, and ligatures placed above and below the rupture, 3 died, and 3 recovered, one of them after amputation from failure of the previous operation to secure the lacerated artery.

In 27 cases ligature of the femoral artery was employed. Of these, 16 recovered; but in 6 amputation was had recourse to; 11 died, 9 after gangrene, and 2 after amputation.

In 38 cases amputation was resorted to. In 12 cases the amputation was primary; of these, 7 recovered and 5 died. In 26 the amputation was secondary; of these, 14 recovered, 10 died, and in 2 cases the final result is not stated.

X. *On the Transference of Poisons from the Blood to the Alimentary Canal.* By ALFRED S. TAYLOR, M. D.

It has long been a recognized fact that poisons received into the stomach and intestines find their way by absorption into the blood, and are thence either temporarily transferred to the solid organs, or eliminated by the various excretions.

From the experiments made by Dr. Taylor and Dr. Pavy, recorded in this paper, it appears that after injecting arsenic and antimony into the jugular vein of dogs, they can afterwards be detected in the stomach and bowels and their contents.

The facts here established may be of some importance in cases where reliance is placed on the presence of mere traces of either of these poisons in the stomach and bowels, as furnishing evidence of recent administration by the ordinary channels.

XI. *Misplacement and Mobility of the Kidneys, in reference to the Diagnosis of Abdominal Tumours.* By ARTHUR E. DURHAM.

The chief value of this communication seems to consist in its offering a quite extensive collection of cases in which the kidneys were either misplaced or movable in the abdominal cavity. The possibility of a change in the position of these organs should be borne in mind in making the diagnosis of certain tumours of the abdomen. A laughable circumstance has impressed this fact upon our own mind, and it may be worthy of narration. M. Piorry supposes himself able by means of his plessimeter to recognize the exact size of the internal organs, and is in the habit of marking out their size, thus recognized, on the skin covering them, by means of a crayon of nitrate of silver. On one occasion, we recollect the opening of a dead body in the dead-house of La Charité, on whose back two huge kidneys were sketched in their proper position, when the abdominal cavity contained only one, and that was down in the pelvis.

XII. *On Hermaphroditism, as illustrated (principally) by Specimens in the Museum of Guy's Hospital.* By ARTHUR E. DURHAM.

In this communication, after declaring his intention of describing, in a series of papers in the *Reports*, the examples of congenital malformations and monstrosities in the Museum of Guy's Hospital, Mr. Durham describes seven cases of hermaphroditism. As the study of such cases affords important aid in the determination of the mutual homological relations which exist between the male and female organs, we will give the view which is most in accordance with the cases he records:—

Ovaries, ... = Testes.
Round ligaments, ... = Vasa deferentia not pervious.
Fallopian tubes, ... = Vesiculæ seminales.
Sinus pocularis and openings into it of the common seminal ducts, in so far as they belong to the vesiculæ seminales, = Vagina and cavity of uterus.
Clitoris, ... = Penis.
Nymphæ, ... = Prepuce.
Labia majora, ... = Scrotum.

This communication is illustrated by one wood-cut and a lithographic plate containing two figures.

XIII. *An Account of Guy's Hospital Well.* By WILLIAM ODLING, M. B.

This paper gives an account of a well, 297½ feet in depth, which was sunk at Guy's Hospital, in 1858, for the purpose of obtaining a supply of water sufficient for the entire wants of the institution. A plate representing a section of the well is appended, showing at a glance the nature of the different strata which were encountered.

XIV. *Contributions to the Practical Surgery of New Growths or Tumours.* Series III. Cysts (*continued*). By John Birkett.

In this communication Mr. Birkett gives an account of a large number of cysts in the neck, of cysts on the spermatic cord, of entozoa-cysts found in various parts of the body; and of cysts developed around foreign bodies.

Among these cases are several which are peculiarly interesting, in which hydatid cysts were developed between the bladder and urethra and the rectum, giving rise to retention and suppression of urine, and thus finally destroying life. The correct diagnosis of such an affection would be much more difficult than its treatment, and the fact of its existence having been established by the observation of four cases should be borne in mind. A plate is appended to this paper representing a sero-cyst in a child, that extended above and below the clavicle.

XV. *On Poisoning by White Precipitate*, by Alfred S. Taylor; *with the Physiological Effects of this Substance on Animals.* By F. W. Pavy.

This paper is a very interesting one in a medico-legal point of view, for white precipitate is not generally described as a poison by toxicologists and chemists. By Orfila and Beck, it is passed over altogether, and Dr. Christison merely states that it may probably act as an irritant, but records no instance of this action. Dr. Taylor details the facts of a recent case of poisoning by this compound, where a child three months of age died with violent purging and vomiting, forty-three hours after its administration.

In the experiments made by Dr. Pavy on animals, the action of white precipitate was that of a powerfully and purely irritant poison. It proved fatal to the dog, rabbit, and mouse, on which animals its effects were tried. The symptoms, of course, differed widely in the dog and in the rabbit, on account of the one being an animal that is most susceptible of vomiting, the other an animal that never vomits. In the dog, the stomach after death was found strewed over with patches of ulceration; the rest of the intestine was almost natural, the stomach being probably the only organ on which the poison could act, from its being rejected by vomiting before passing further down. In the rabbit the cæcum and large intestine were also ulcerated, and the kidneys were affected, being very large, and having many of the tubules filled with a whitish deposit, composed principally of the phosphate of lime. The results of these experiments proved:—

1st. That white precipitate, like other insoluble mineral poisons, is absorbed, and its mercury is deposited in the organs. It is probably rendered soluble by the acid secretions of the stomach.

2d. That the kidneys are the chief receptacle of the poison, the liver containing a trace, and the heart none. The intestines appear to retain the poison only in small quantity.

3d. That whether the quantity administered be large or small, and whether given in one or several doses, the quantity found in the body of the animal was, in each case, very small.

A lithographic plate containing a number of figures is added to the paper, for the purpose of showing the effect of the administration of white precipitate, in repeated doses, on the kidney of the rabbit.

XVI. *Case of Ovarian Tumour containing Teeth, Hair, etc., with Remarks.* By S. James A. Salter, M. B., F. L. S., etc.

The ovarian tumour, the subject of this communication, was found in the body of a married woman 49 years of age, the mother of several children. It was about the size of an orange; when opened a quantity of serous fluid, large white masses of fat, and bundles of hair escaped. The interior contained three teeth implanted in a mass of bone, and a small dark-coloured projecting surface from which some fine, pale-brown hair sprouted. All the tissues were subjected to careful microscopical examination.

Sections of the teeth, both vertical and transverse, of all three tissues, enamel, dentine, and crusta-petrosa, presented every normal appearance; it was utterly impossible, from structural examination, to discover any difference between these and ordinary human teeth. The most interesting result of this investigation, however, was the discovery of *nerves* in the tooth-pulp. In an account of a dissection of an ovarian cyst, by Mr. Gray, in the *Medico-Chirurgical Transac-*

tions, vol. xxxvi. (1853), he describes a quantity of nervous matter composed of a very large number of varicose nerve-tubules of varying size, intermingled with the elementary components of gray matter, viz., nuclei and nucleated vesicles containing granules, and states that nervous matter, as far as he has been able to ascertain, has never been previously found as forming a part of the contents of these cysts. This case of Mr. Salter's is the first, we believe, in which nerves normally distributed among other tissues have yet been described.

The different structures that have been found, from time to time, by different anatomists, in these ovarian developments, as enumerated by Mr. Salter, are, a nervous centre, distributed nerves, bloodvessels, bone, periosteum, dentine, crusta petrosa, enamel, tooth-pulp, unstriped muscle, striped muscle(?), areolar tissue, adipose tissue, epithelium, epidermis, sweat ducts, sebaceous follicles, and fœtal hair. Such an aggregation of structures represents a fresh individual of a succeeding generation, though the anatomical *form* of that individual is not normal.

What calls forth these curious ovarian developments, and whether they are the result of conception as it occurs normally in the human subject, are questions that have been much discussed. That they are not the result of conception seems to us to be certainly established by their having been found in the bodies of persons of whose maiden purity and of whose physical virginity there could be no doubt, and also by their having been found in the bodies of persons so young that gamogenesis was a physiological impossibility. The question as to what calls forth these ovarian developments appears to receive its answer in the analogy which these formations have to the non-sexual reproduction which is now known to prevail in many of the lower animals.

Until Bonnet, about a century ago, first established the fact that certain insects, *Aphides*, may multiply without sexual intercourse, the doctrine was universally held that animal life could alone be propagated by the conjugation of the sexes. Since then instances of independent female fertility have become so well established and so numerous that the whole aspect of the physiology of reproduction has been changed. In a late volume of the *Transactions of the Linnæan Society*, in an article on the organic reproduction and morphology of aphis, Professor Huxley says: "Time was when the difficulty of the physiologist lay in understanding reproduction without the sexual process. At the present day, it seems to me that the problem is reversed, and that the question before us is, Why is sexual union necessary?"

Two plates, containing a number of figures, representing the situation of the cyst, the teeth, and the appearances of certain of its contents under the microscope, accompany this communication. W. F. A.

ART. XXII.—*Cours Théorique et Clinique de Pathologie Interne et de Thérapie Médicale, par* E. GINTRAC, Professor de Clinique Interne et Directeur de l'Ecole de Médecine de Bordeaux, Membre de la Commission Administrative des Hospices Civils, etc. etc. Tomes 4e et 5e, 8vo. pp. 750, 821. Paris, 1859.

A Theoretical and Clinical Course of Internal Pathology and Medical Therapeutics. By E. GINTRAC, Professor of Internal Clinic, Director of the School of Medecine of Bordeaux, Member of the Administrative Commission of the Civil Hospitals, etc. etc. Vols. IV. and V.

M. GINTRAC ascribes the very great delay which has occurred in the appearance of the fourth and fifth volumes of his great work on theoretical and clinical medicine, to occupation of his time in the fulfilment of the important duties devolving on him as one of the commission having charge of the administration of the civil hospitals. The first three volumes received a notice at our hands soon after their publication. They displayed throughout, very clearly, the entire competency of the author for the task he had undertaken, and his perfect fairness in its execution. Their character was such as to render us anxious for the completion of what had been so ably begun.

In the two volumes before us we find displayed the same industry and judgment in the selection of materials to serve for the history of the several maladies treated of; for the elucidation of their causes, characters, march and terminations, and for the exposition of those plans of treatment which are best adapted to conduct them to a favourable termination. The facts he has presented are collected from every reliable source, and arranged in a manner the best adapted to exhibit with clearness the results to which they would seem legitimately to lead. No attempt has been made to systematize beyond what carefully conducted and well authenticated observations fully warrant; nor has any effort been exhibited to gain a reputation for originality by the construction of novel theories of disease or new plans for its treatment. In the discussion of every question which presents itself in connection with the subjects with which he treats, M. Gintrac exhibits a closer adherence to the facts he has to deal with, a less inclination to divert them from their most simple and apparent meaning than most of the medical writers of his country and times.

The volumes under review are occupied with that portion of the author's course which comprises the pathology and therapeutics of the diseases of the skin; namely, 1st. The *eruptive fevers* and acute *exanthemata* generally; and 2dly. The chronic cutaneous affections. Each of these divisions of skin diseases is preceded by a series of general propositions, regarding the leading peculiarities to be observed in the etiology, local characteristics, concomitant pathological conditions, march, and terminations, *etc. etc.*, of the several classes of disease embraced in it.

It will not be expected that we should present either a critical notice, or a general analysis of the different sections included in either of the volumes before us. The task would be most certainly an agreeable and by no means a profitless one; but the fulness with which M. Gintrac has treated on all the more prominent subjects—the account presented of each disease falling, in most instances, little short of a complete monograph—would require for the fulfilment of the task space far beyond what would be proper for us to occupy. All we propose to do is to notice such portions of the work as appear to us to present points of particular interest, with a recommendation of the entire treatise to the careful study of all who would desire to make themselves intimately acquainted with the actual condition of our knowledge of the pathology and therapeutics of the leading cutaneous diseases which occur in the daily rounds of practice. From no source can there be obtained fuller and more reliable information, and of a more directly practical application.

The first three hundred pages of volume fourth of M. Gintrac's course are occupied with the consideration of variola, varioloid, varicella, and vaccina. The latter subject, in all its important bearings, is treated with the greatest fulness and ability.

The author assumes it as a fact, established by the most incontestable and conclusive evidence, that vaccination is capable of affording to a certain number of those who have been submitted to its influence, absolute and permanent protection against the occurrence of smallpox; to others a protection which continues but for a definite period, and to others, again, only a partial protection; though even in these latter, should an attack of variola subsequently ensue, the previous vaccine infection will be found to exert an influence over the latter sufficient to cause it to be less severe, of shorter duration, and far less destructive of life.

A series of general conclusions drawn from the best authenticated observations upon record, are presented by M. Gintrac, to exhibit the extent to which the variolous and vaccine infections reciprocally influence each other when they coincide in the same individual. These conclusions are—

1st. That, in numerous instances, where the joint occurrence of smallpox and the vaccine disease has happened in the same individual, no evidence has been presented of any direct influence being exerted by the one disease upon the other. Both have proceeded regularly through their respective courses, and with their ordinary degree of intensity.

2d. That, notwithstanding, it is a well established fact that the infection of smallpox concurring with that of the vaccine disease, may exercise a marked influence upon the latter. The vaccine infection may be entirely extinguished, or it may be retarded in its development until the sixth, seventh, eighth, ninth, or tenth day: or it may be retarded in the several periods of its course, or arrested entirely for a period, at one or other of its stages, subsequently, however, resuming its course and proceeding on regularly to its termination. The vaccine pock, also, may be essentially modified, its areola being very much diminished or entirely wanting; or the subjacent induration and tumefaction may be diminished or absent; or the usual tension of the raised circumference of the matured vesicle may be absent, while, in other cases, a suppuration similar to that observed in the pock of discrete smallpox takes place.

3d. That, on the other hand, the vaccine infection may modify that of the smallpox, when the two occur simultaneously. The modifying influence appearing to be the most decided in proportion as the vaccine disease has arrived the nearest to its termination. Thus: 1st. The inoculation of smallpox performed on the ninth or eleventh day subsequent to a successful vaccination always fails. Performed on the fourth, fifth, or seventh days, it is sometimes followed by an eruption which Mongenet has shown to consist of small, hard, horny prominences, without fluid contents and desiccating by the seventh, but sometimes as late as the fifteenth day. 2d. According to the observations of James Bryce, the inoculation of vaccinated individuals with smallpox matter will give rise to an eruption of vesicles, which in their form, and the character of the fluid they contain, have a very close analogy to those of the vaccine disease. 3d. Numerous observers have attested to the benignity of the smallpox which occurs conjointly with the vaccine disease in the same individual. It is, in their estimation, simply a *varioloid* affection—while, in the same house or neighbourhood, the smallpox may prevail, presenting in the unprotected a very intense or even confluent form. 4th. The smallpox has been known to commence with violent fever and other symptoms of a threatening character, and the attack to become, afterwards, so soon as the vaccine disease has been developed in the patient, perfectly mild and run a favourable course. 5th. In the vaccinated, when smallpox occurs it is either unattended with secondary fever, with swelling of the face or with ptyalism, or these symptoms, if they do occur, are very slight. 6th. The duration of the attack of smallpox is reduced to twelve, eight, six, five, or even four days.

The foregoing facts, besides evincing the protective powers of vaccination, under ordinary circumstances, show, also, the vast importance of its being practised generally, whenever smallpox appears as an epidemic amid any community —even in individuals who have been already fully exposed to the contagion of the disease. Numerous facts are on record showing that even when vaccination has been practised in an individual in whom the variolous eruption has already made its appearance, it has in many cases exerted an important modifying influence, diminishing the virulence, and shortening the duration of the disease.

The question as to the true character of *varicella* has been very frequently discussed, and is still very far from being definitely settled. There are some who still insist that it is merely a modified form of variola—a true *varioloid* affection occurring independently of the modifying influence of vaccination—while there are others, and perhaps these constitute the greater number, who insist that it is an independent, specific, eruptive disease.

After a careful examination of the facts that have been observed, bearing directly upon the subject, M. Gintrac has arrived at the following conclusions, namely:—

"1st. The *varicella* may prevail under the same circumstances as the *smallpox*, and appear often in such a manner as would seem to indicate that it owed its origin in some manner to the latter disease.

"2d. It has been supposed that *varicella* is capable of giving rise to smallpox, but there are serious doubts as to the correctness of such an opinion.

"3d. *Varicella* and *smallpox* are entirely distinct diseases, comporting themselves towards each other and in respect to the vaccine infection in a manner altogether distinct the one from the other.

"4th. Notwithstanding their apparent analogies *smallpox* and the *varioloid* *disease*, on the one hand, and *varicella* on the other, are distinguishable from each other by the difference in the poison by which they are respectively produced, by their essential characteristics, and their special affinities, as well as by their anatomical characters, and the peculiarities of their respective eruptions."

It is certainly a very curious circumstance that, if *varicella* be a disease so entirely distinct from *smallpox* as it is supposed to be, it should ordinarily make its appearance during the epidemic prevalence of the latter; or should succeed it, and conform itself to its particular movement after a short interval, in the same locality.

M. Gintrac, at the Internal Clinic, has known the smallpox, varioloid, and varicella to coincide, presenting an exact relation to each other, in respect to the number of cases of each disease, year after year, as seen by the annexed table. This we think of sufficient interest to warrant our inserting it entire:—

In	1839	there	were	26	cases	of *smallpox*,	15	of *varioloid*,	and	13	of *varicella*.
"	1840	"	"	18	"	"	21	"	"	6	"
"	1841	"	"	10	"	"	4	"	"	2	"
"	1842	"	"	5	"	"	2	"	"	3	"
"	1843	"	"	1	"	"	1	"	"	3	"
"	1844	"	"	22	"	"	14	"	"	25	"
"	1845	"	"	5	"	"	3	"	"	6	"
"	1846	"	"	13	"	"	6	"	"	7	"
"	1847	"	"	25	"	"	14	"	"	13	"
"	1848	"	"	15	"	"	6	"	"	8	"
"	1849	"	"	13	"	"	7	"	"	9	"
"	1850	"	"	5	"	"	6	"	"	3	"
"	1851	"	"	5	"	"	3	"	"	8	"
"	1852	"	"	16	"	"	15	"	"	31	"
"	1853	"	"	9	"	"	9	"	"	7	"
"	1854	"	"	32	"	"	38	"	"	13	"
"	1855	"	"	16	"	"	14	"	"	7	"
"	1856	"	"	7	"	"	14	"	"	9	"
				243			192			173	

The next subject discussed is *scarlatina*, its etiology, pathology, and treatment. To this, one hundred pages of the volume are devoted. The account given of the disease is very complete and satisfactory. The leading facts known in relation to it have been collected with surprising industry and arranged with judgment. The author's deductions from them, aided by his personal experience, are, in general, cautious and truthful.

After disposing of scarlatina, M. Gintrac next takes up the subject of *measles;* in connection with which he treats of two other eruptive maladies which are supposed to have more or less affinity with it, if not in their actual pathological nature, in, at least, their leading phenomena. Both these latter diseases have been repeatedly observed by our own physicians. Their true nature and relations are, however, but little understood.

Rougeola, morbilli, and rubeola are given by most writers as synonyms of one and the same disease, that, namely, known to us under the name of measles. By the French writers, generally, the term *rougeola* is employed to designate measles, while Sauvages employed indifferently the terms *morbilli* and *rubeola*. By the German physicians, however, the last-mentioned term is applied to an eruptive affection entirely distinct from measles, while Willan and Bateman apply it exclusively to the latter affection. In consequence of this want of uniformity among medical writers in the use of the terms referred to, not a little confusion has crept into the nomenclature of measles and certain allied exanthems. M. Gintrac would have the term morbilli used to designate measles—the rougeola of the French. This disease to be always spoken of as the *morbillous exanthem*, and not as *rubeolous*.

There are then, we may remark, three distinct diseases: morbilli, rubeola, and roseola; all of which have apparently a close relationship.

Morbilli, or measles, is an acute, febrile, contagious exanthem, marked, 1st.

By red, distinct patches, small in size, irregular in form, and disseminated over nearly the entire surface of the body; 2d. By an irritation more or less acute, and a catarrhal condition of the mucous membrane of the eye, nose, and laryngo-bronchial tube.

Rubeola, according to the German medical authorities, is a hybrid disease, presenting a combination of the symptoms of both scarlatina and measles. It is not a simple combination of the two, where each of the diseases maintains throughout its individuality, the one succeeding the other without being confounded with it, but an actual fusion of the two. If the characteristics of the one seem to predominate, they are nevertheless not the less evidently under the control of the other.

The phenomena which occur in the mucous tissue indicate the coexistence and co-operation of the two morbific elements, and the phenomena of which the skin is the seat, prove their reciprocal modifying influence. The eruption being not exactly that appertaining properly to either of the two diseases which are present.

"In admitting that *rubeola* is a kind of mixed disease, or hybrid, which is equally distinct from scarlatina and measles, having a special being and special attributes, we may conclude from a collation of all the facts in our possession.

"1st. That it is sometimes sporadic, and may also appear under an epidemic influence.

"2d. That under certain circumstances, it has appeared to be the result of the occurrence simultaneously in the same individual, of the morbillous and scarlatinal infections.

"3d. That although itself the result of contagion, it is, nevertheless, not propagated by contagion.

"4th. That it never attacks the same individual a second time.

"5th. That the previous occurrence of scarlatina or measles is no protection against an attack of rubeola.

"6th. That it has been observed in infants, and young subjects generally, occasionally in adults, but very rarely in those of advanced age.

"7th. That its onset may resemble that of scarlatina or that of measles, but very soon the symptoms of both diseases become united, so that on the one hand we have ocular irritation, coryza, laryngitis, and bronchitis, and on the other, angina, redness of tongue, tumefaction of parotids, otitis, etc.

"8th. That the eruption, which makes its appearance from the third to the sixth day, and sometimes sooner, spreads very rapidly over the entire body, but sparing often the face. It presents itself under the appearance of large angular distinct patches, often confluent, and of a more or less bright hue.

"9th. That the patches are often beset with vesicles; sometimes they present irregularities, and varied aspects, in different subjects and on different portions of the surface; and are very generally followed by a very decided furfuraceous and lamellar desquamation of the cuticle.

"10th. That, in general, rubeola has a duration of from five to ten days.

"11th. That while it has ordinarily a character of some severity, its termination is more frequently favourable than otherwise.

"12th. That its most common sequela are abscesses of the neck or dropsical effusions, especially anasarca."

Roseola is an exanthem of red patches scattered over the surface of the body; it is preceded by fever, but is unattended with any special affection of the mucous tissues. In its acute form it is liable occasionally to be confounded with scarlatina or measles.

When the patches of roseola are large and approach each other closely, Gregory has known it to be taken for an attack of scarlet fever; more especially is this liable to occur when, as often happens in severe cases, there is some redness of the pharynx. The error of diagnosis, in even those cases in which the semblance to scarlatina is the strongest, will be speedily rectified. The intensity of roseola seldom bears any comparison with that of scarlet fever. The patches in the first always remain distinct, while they quickly coalesce in the second. The slight redness of the pharynx which is met with in cases of roseola, bears no comparison with the intense angina observed in scarlatina.

There is, confessedly, a much closer resemblance between roseola and measles than between it and scarlet fever. The patches in measles are, however, smaller and more regular in shape. But if our diagnosis be predicated solely on the character of the eruption it will be found somewhat difficult to distinguish between the two diseases. There is reason to believe that many of the cases of reputed recurrence of measles have been nothing more than attacks of roseola succeeding to an attack of the former disease. The most certain diagnosis is based upon the march and duration of the two maladies. The measles runs through its several periods more slowly than roseola, and the eruption is less prompt in its appearance. It is a disease, besides, of greater severity. In roseola there is an absence of those symptoms which denote a fluxion to the mucous tissue of the eyes, nose, and bronchi; there is also a liability to a recurrence of the disease; it is, finally, not capable of being propagated by contagion.

Among the remaining subjects treated of in the fourth volume is a very complete exposition of the history, pathology, and treatment of *purpura*, *epidemic miliary fever*, and the several forms of *pemphigus;* drawn up with much ability, and conveying clear ideas of the character, phenomena, and march of these affections, with a satisfactory *resumé* of the results of clinical experience as to their proper treatment.

The first of the diseases treated of in the fifth volume is *erysipelas;* in regard to which M. Gintrac presents a very fair digest of the leading facts upon record; he has not, however, drawn from these facts what in our estimation are the legitimate deductions to which they lead. In that form, at least, of erysipelas which is liable to prevail epidemically, and which in many portions of the United States has extended over large districts of country, and at times caused no inconsiderable amount of mortality, we certainly have something more than merely a specific inflammation of the *skin*, even though this inflammation be referred to some general modification of the organism. The facts that have been collected of late years in regard to the etiology and pathology of the disease have led us to consider it as a true zymosis; in many cases presenting no affection whatever of the surface, but instead of it an intense, often very acute inflammation of the mucous tissues—particularly of the fauces and respiratory organs, or of the serous tissue of the abdomen—the peritoneum.

Following the account of erysipelas is a very excellent one of *sclerema* or induration of the subcutaneous cellular tissue of infants.

After adducing a synopsis of the facts that have been recorded in reference to the history, causes, symptoms, varieties, complications, duration, and terminations of this curious and but little understood affection, M. Gintrac presents the following as the general conclusions to be drawn from these in regard to its true pathological character.

Sclerema is not the result of syphilis as Doublet supposes, nor of pneumonia as Hulme believes, nor of gastro-enteritis, nor of a lesion of the liver, and a morbid state of its secretion causing an augmented plasticity of the fluids; it does not result from a non-occlusion of the foramen of Botalus, nor is it the result of a progressive asphyxia of the new-born infant. This is evident from the fact that syphilis is only a very rare coincidence—that the lungs are often healthy, and when not so rather congested than inflamed—that the stomach and intestines are often in a normal condition. Jaundice when it occurs is a simple complication, while lesions of the liver are of rare occurrence or of little importance. The foramen of Botalus and the arterial canal are often found more or less completely obliterated; in fine, the infants attacked with sclerema have really respired, and their lungs have become fully dilated at the moment of birth, and if asphyxia occurs it is rather the effect than the cause of the disease.

Let us consider, says M. Gintrac, the circumstances under which acute sclerema is produced. A being, who had lived a borrowed life, protected on all sides from external influences, is suddenly abandoned to itself and surrounded by new agents which produce a painful impression upon its organs. It is particularly feeble, and if the impressions to which it is subjected are intense and prolonged, morbid effects will necessarily occur, in consequence of the difficulty with which it resists the difference in the circumstances amid which it is so suddenly placed. M. Hervieux has carefully studied the influence direct of these causes in the production of the *progressive algidity* of the new-born infant. The gradual slackening of the circulation and respiration; the lowering, more and more evident, of the heat of the body; the gradual extinction of the life of the infant, constitute the distinctive characters of that condition, which, though not sclerema, is frequently one of its elements. The occurrence of sclerema M. Gintrac supposes to be consequent on an attempt at reaction. The afflux towards the periphery, the injection of the cutaneous capillaries, the tumefaction and hardening of the subcutaneous tissue indicate an organic effort, a congestion, and, when erysipelas complicates the sclerema, even a special inflammatory action.

Sclerema is, therefore, according to our author, a complex affection, while the progressive algidity is a more simple morbid condition, a more directly physical result of exterior influences. Congenital sclerema is not due, of course, in any degree to these influences. It shows, on the contrary, the evidence of an afflux of fluids and a primitive engorgement of the tissues. This congestive condition gives only a very inadequate idea of sclerema. The disease is produced when an effort at reaction commences, but is not accomplished—when it exhausts itself in useless efforts—when the fluids accumulated in the vessels or extravasated are, as it were, arrested and coagulated. When the local circulation is arrested at the same time the caloricity decreases and the vitality becomes extinct. But this defect of reaction renders it presumptive that either the perturbing cause is of some intensity, or that the strength of the organism, already exhausted, is insufficient to produce an efficacious effort. In comparing these several circumstances, we recognize as elements of sclerema a debility of the new-born infant, either primitive or acquired; a refrigeration either momentary or sustained; congestions of the central organs and of the periphery; inefficient attempts at reaction of short duration; a rapid decrease of calorification, of the circulation, of respiration, and of innervation—a gradual abandonment of the organism to the general laws which preside over inanimate bodies.

The treatment of sclerema is by no means well settled. The few observations of a truly practical bearing which have been published in respect to the most rational therapeutic management of the disease have been collected by M. Gintrac; as we know of no one who has presented so satisfactory a digest of these we believe that we shall be performing an acceptable service to our readers by presenting that digest entire.

"To prevent the occurrence of acute sclerema the utmost care should be taken to prevent the new-born infant from becoming chilled. If carried from place to place it should be warmly clad, and early supplied with good milk. When any indication is presented of the development of the disease our care is to be redoubled. The air of the chamber which the infant occupies should be kept at a temperature of from 15 to 16 degrees Centigrade—68° to 70° Fahrenheit. The infant from time to time should be placed before but not too near a clear fire, its position at the same time being frequently changed. Its head should be kept constantly somewhat elevated, all compression of the trunk and limbs avoided; they should be kept free from all restraint, but at the same time enveloped in wadding and flannel. Frictions of the surface should be practised with a soft warm hand, and at the same time a species of kneading of the parts that are engorged, hard, and cold.

"M. Legroux has presented some very interesting practical remarks upon the utility of kneading and muscular excitation in this disease, by which he has been able to save a number of infants. The success of this treatment is due in great part to the early period at which it is put in practice. There is no reason, however, that even after several hours have elapsed since the invasion of the disease we should not endeavour to realize, some, at least, of the benefit which M. Legroux claims to have derived from frictions, gentle and methodic pressure upon the limbs, and upon the thorax to solicit and render more complete both expiration and inspiration, and causing the limb to perform the movements of flexion and extension, etc. M. Hervieux insists upon the utility of these proceedings, but more especially those adapted to remedy the progressive algidity, which is the primary element of the disease. We should not forget, at the same time, to put the infant very frequently to the breast of a healthy nurse.

"Tepid and aromatic baths have been employed; those of vapour have, however, been considered as more efficacious. By Souville the infants were exposed to the action of the vapour by being placed upon an osier platform, and turning them constantly in every direction; a more ingenious apparatus, however, is employed at the Foundling Hospital: The infants there are placed to the number of six or twelve, upon a hammock, and this is inclosed in a kind of glass stove—here they are left for about twenty minutes. Under the influence of the bath the infants experience a sense of comfort, and on coming out of it apply themselves more readily to the breast. Valleix is fearful that the vapour bath, which can acquire a temperature of even 36 to 40 degrees (110° to 112° Fah.), may produce serious congestions. Its proper use requires, certainly, great care and no little practice.

"The state of plethora, the lividness of the surface, and the vascular injection detected after death have suggested the detraction of blood. Liberali and Palletta have had recourse to leeches to the legs or upon the thorax. The last-mentioned writer speaks of them as particularly efficacious: MM. Léger and Valleix have both seen good results from their use. M. Gintrac tested their effects in 1826 at the Foundling Hospital. The first patient upon whose epigastrium a single leech was applied lost a large amount of blood, and sank rapidly. In a second case, the utmost watchfulness was observed; at the end of two hours the bleeding having been arrested by the use of a crayon of nitrate of silver, the infant was well. The same result was often observed. The application of a single leech seemed to him always to be sufficient. It is in œdematous sclerema that this moderate loss of blood is beneficial, especially if indications are present of pulmonary or cephalic congestion. When there is pallor of the surface, with intense coldness and a very great hardness of the affected parts, in a word, when the indications of adipous or concrete sclerema are present, the application of even a single leech would be improper.

"In a similar case Andry and Auvity have had recourse to blisters to the thighs; it would be better, perhaps, to apply them to the chest.

"Fomentations with a decoction of cinchona have been employed, as, also, frictions with camphorated and aromatic liniments, etc., or inunction with the mercurial pommade. These topical applications are all inferior in efficacy to the kneading process of M. Legroux. Finally, the ipecacuanha has been used internally by Horn, a tonic potion by Chaussier. In the more grave cases, however, there is a difficulty in swallowing—while in the lighter cases the remedies indicated are useless. In both, milk will be found to do more good than either. For the new-born infant it is the best of tonics."

Among the acute eruptive diseases subsequently treated of by M. Gintrac, the most prominent are *erythema* and urticaria: then follows the consideration of the chronic cutaneous diseases, including those, also, of the hair, nails, etc. The latter department exhibits on the part of M. Gintrac the same patient industry in the collection and collation of facts, the same caution in the deductions he has drawn from them, and the same ability in the application of these for the elucidation of the character of the diseases treated of and their most successful management. In the author's account of the different chronic cutaneous affections there is much to interest, and we could very profitably indulge, could we afford the space, in many an extract. In conclusion, we would recommend the work before us as a most valuable addition to the library of every practising physician. D. F. C.

ART. XXIII.—*Infant Feeding and its Influence on Life; or the Causes and Prevention of Infant Mortality.* By C. H. F. ROUTH, M. D., M. R. C. P. E., M. R. C. S., Physician to the Samaritan Free Hospital for Women and Children, etc. etc. 12mo. pp. 379. London, 1860.

THE proper feeding of infants is a subject which commends itself to the attention of all: the physician, the parent, and the philanthropist are all equally interested in its study. There are few things, however, in relation to which there exist, in all directions, a greater amount of ignorance, and more mischievous prejudices. The mistakes daily committed in respect to it are productive of a large amount of suffering and mortality among our infant population. Even when errors in the feeding of infants do not act as a direct cause of disease they impair the nutrition of the child's system, reduce its vitality, and predispose it thus to the attack of maladies of the most serious character.

All perhaps are agreed that the only natural and appropriate aliment of the infant during the first eight, ten, or twelve months of its existence is the milk supplied it from the breast of its mother, or from that of a suitable nurse; and few will deny that it is a duty incumbent on every mother to suckle her babe. No one who has carefully examined the subject but will confess that by a neglect of this maternal office moral and physical evils are nearly always entailed upon the parent, and often irremediable injury upon her offspring. Still, there certainly do occur instances, more rarely perhaps than has been generally supposed, in which the infant cannot be nourished at the breast of either its mother or of a suitable nurse. Now, under these circumstances, the important question presents itself, what is to be done? where are we to find a proper substitute for the natural aliment?

The question is taken up and most fully and ably investigated by Dr. R., and under circumstances that would seem to be well adapted to insure a good degree of accuracy in the conclusions at which he arrives.

Dr. R. commences by showing, from authentic and varied statistics, the very high ratio of mortality which everywhere occurs among infants in foundling hospitals. He believes it to be an error, however, to refer this excessive mortality to the deprivation of breast-milk as its only or principal cause. In the several foundling hospitals no common law of mortality is to be observed, not even in the same institution during different years, to warrant the conclusion that in all of them there is one common morbific cause in operation—and that that cause is the absence of breast-milk in the dietary of the inmates. However injurious and destructive the latter may be, there are many other morbific causes also in co-operation. The several foundling institutions are placed in very dissimilar circumstances as to climate, location, cleanliness, and the number of their inmates. The quality of food supplied, and the principles upon which the children are fed, in these institutions, are so different, that absence of breast-milk could only account for a small share of the mortality. It is asserted and indeed proved that in Ireland, the mortality among orphans and foundlings in the hospitals is less than among the children of the general population out of doors.

From a large number of facts and statistics which have been collected and carefully collated by him, Dr. R. arrives at the following general conclusions:—

"1. That for the ages of one year and under five, the mortality, even under ordinary circumstances, is in towns nearly double what it is in the country; but this difference in the mortality according to residence is nearly seven times as great for foundlings; therefore, foundlings should never be maintained in towns.

"2. That in Ireland, while it is doubtless very high in the first month, for those under one year it is only 30 per cent. in towns, and 22 per cent. in the country; the worst mortality with foundlings being 50 per cent.

"3. That travelling in fair seasons is not dangerous to foundlings.

"4. That the mortality is greatest in spring, and least in autumn, with children in public institutions.

"5. That a chief cause in the mortality of foundlings is want of exercise, and the abuse of the recumbent position.

"6. That want of breast-milk will only account for a mortality of 3.4 per cent. additional.

"7. That a depraved hospital atmosphere and certain endemic contagious disorders are the chief causes of the mortality in foundling hospitals."

After adducing a series of very striking facts and statistics in illustration of the advantages of breast-milk for the food of the infant in insuring its life and proper and harmonious development, Dr. R. proceeds to examine the reasons that are urged why a mother should not suckle her child, and he shows very clearly as the result of such examination how very few are the valid causes that should justify a parent in the abandonment of her maternal duties towards her infant.

The subject next discussed is the proper selection of a wet nurse when one is necessary. The importance of good moral character, general intelligence, and evenness of temper in the nurse every one will admit; but the physical qualifications the possession of which is essential to enable her to perform her duty towards the infant committed to her charge are not so well understood; they are thus enumerated by Dr. R.: 1. She should have good milk, the characteristics of which are given. 2. Her hereditary predisposition should be good; especially should she be free from any proclivity to tuberculosis, syphilis, or indeed any transmissible malady. 3. Her age should not exceed 30. 4. The period of her confinement should not have been many months before or after that of the child's mother. 5. She should not be of a melancholic temperament. 6. Her milk should not only be good in quality but also sufficient in quantity. 7. When, however, an infant cannot be suckled entirely by a wet nurse, artificial feeding may be assisted by its being occasionally put to the breast of a married woman who is at the time nursing her own infant.

The immediate morbid results of defective assimilation in infants consequent upon the use of improper aliment, in conjunction with the effects of bad air and want of cleanliness, are very accurately depicted by Dr. R. He divides the morbid condition or atrophy induced under such circumstances into three stages. During the first stage, there may be a semblance of health, the spirits of the child being but little affected. More commonly, however, it is at times, and apparently without cause, unusually peevish and irritable. Its flesh becomes flabby and the skin loses the silky texture so common in healthy children during the first months of existence. The infant will frequently throw up its food having an intensely acid smell. Its appetite is impaired and its sleep is disturbed. The bowels may be constipated; the stools, when obtained, being clay-like with white lumps in them. All these symptoms are increased in intensity during the second stage. There is now more decided irritation of the intestinal canal; frequent vomiting and diarrhœa may be present, the stools being very green and offensive, and so acid as often to excoriate the fundament and surrounding parts. The emaciation is more rapid, the eye assumes a peculiarly bright expression, and the child has an aged look. Sometimes there is no diarrhœa; the stools, however, when they occur being replete with undigested matters. Emaciation is always present. A further development of the symptoms enumerated constitutes the third stage. The child's appetite becomes voracious, nothing seems to satisfy it. Aphthæ appear in the mouth and gradually extend down the alimentary canal. There is often an unmanageable diarrhœa: thirty to forty motions a day, of little else than undigested food, are not uncommon. The emaciation becomes frightful: in the course of a few hours the infant acquires the look of a wrinkled old man. There is an unnatural brightness of the eyes, which seem to project beyond their sockets. The voracity continues to the end. It is sleepless, constantly whining or crying. Emaciation constantly goes on until the child dies in the last stage of inanition.

Dr. R. believes that the aphthous form of the disease, especially when a number of children are congregated together in small and unventilated apartments, is apt to assume a contagious character and become exceedingly malignant. The disease being communicated by the use of the same towel, spoon, or artificial nipple. The aphthæ in these cases are not confined to the mouth and alimentary canal, but occur occasionally upon the conjunctiva, upon the vulva in girls, etc.

When diarrhœa is absent the disease may extend over a period of several weeks. It is singular how the little shrivelled, old-looking child will be seen to smile at one, particularly after a meal; a temporary sunbeam appearing as it were in the midst of the general wreck. In these protracted cases no quantity or kind of food, no form of medicine will do any good, however assiduous and varied are the trials made.

Sometimes after running into the second stage, or it may be even in the first, the disease does not follow out the course described—primary assimilation is defective only, not entirely arrested. Tuberculosis then makes its appearance, generally as *tabes mesenterica*, more rarely as *phthisis*. By far the most common of the maladies developed, however, is *anæmia* with more or less of *rachitism*.

The post-mortem appearances are, extreme emaciation, little fat remaining; very scanty cellular tissue; great wasting of the muscles throughout. In cases attended with diarrhœa, the entire alimentary canal is lined with red patches and aphthæ, varying in size from that of a pin's head to that of a bean. Peyer's glands are much reddened and swollen. In some cases no aphthæ are present, but the mucous membrane from below the biliary ducts is much reddened, with a bloody intensely acid mucous exudation upon its surface. When there has been no diarrhœa the alimentary mucous membrane is pale, but Peyer's glands are much swollen, projecting from the mucous membrane in round patches, some three or four lines broad by ten or twelve long, apparently filled with exudation, and precisely similar to their condition as observed in cases of Asiatic cholera.

The proximate as well as the remote causes of defective assimilation in the infant being most intimately associated with bad or defective alimentation during the first stage of existence, Dr. R. proceeds to discuss the correct principles of feeding during infancy, laying down at the very outset the two following positions in respect to the management of infants, as essential to their preservation: 1st. That the infant, especially during the early periods of its existence, should be kept warm, artificially or naturally, during the time it is being fed; 2d. That a child should be made to take at such periods the semi-erect position, which is the natural one.

Dr. R. maintains, and we think very properly, that animal food is indispensable during infancy. Food to be capable of supporting life must contain three substances in due proportion: 1. Plastic or nitrogenous matter to nourish the fleshy parts of the body—fibrin, albumen, or casein; 2. Calorifiant or combustible matter, *i. e.* hydrocarbons, to supply the respiratory process, to keep up animal heat, and to provide fat for the body—fats and oils, sugar and starch; 3. Mineral matters, or salts, to supply the bones, and hold in chemical union, combination, and action, the solids and liquids of the body—lime, potash, soda, magnesia, in union with phosphoric, sulphuric, hydrochloric acids and many others. Milk contains all these elements: Casein, the plastic ingredient; fat and sugar, two combustible substances, and the several needed mineral matters. Hence milk if given in sufficient quantity will support life for any length of time. The proportions in which these three elements of food are contained in other aliments vary: it should be, at least, 10 of plastic to 30 or 40 combustible, while the mineral should vary from 1.5 to 6 or 7 per cent.

Dr. R. points to the fact that the best and most simple substitute for human milk is, clearly, milk from some other animal, especially when this can be taken by the infant by suction direct from the nipple of the animal. The milk of the ass, goat, and cow, are the substitutes usually resorted to. The milk of the ass contains more water than that of the human female; only about half as much butter and casein, but nearly twice as much sugar and salts. Goat's milk approaches nearer in composition to woman's milk. The quantity of the milk varies somewhat in the different breeds of goats, and, also, according to the nature of the food the animal is fed on, and the care bestowed upon its keeping. Cow's milk has less water than women's milk, a larger amount of solid matters; more casein, more butter, and more salts, but less sugar. Like that of the goat its qualities, also, are modified by the breed, the food, and the care taken of the animal; usually also by the season of the year. It is probable that the milk of either the goat or cow, when either animal is healthy, and properly fed and cared for, will furnish an aliment well suited for children who are necessarily deprived of the mother's breast or that of a good nurse. Dr. R. believes that the milk obtained from cows fed upon beet-root, with a very small dilution of water, might be brought so closely to resemble human milk as in all respects to perform the same services.

The efforts to rear infants upon the milk of animals will often fail, however well to all appearance conducted. The use of such milk often gives rise to the generation of a large amount of acid, and not unfrequently to a wasting diarrhœa. When this is the case, it is said that a mixture of one pint of cream to three of water will often prove very beneficial. Cream contains very nearly the same ingredients as milk, except that the casein is diminished, and the fatty matters considerably increased. In this manner, Dr. R. remarks, the absence of sugar is compensated for by the excess of fatty matters, and the mixture becomes sufficiently rich, both as a nutritive and calorifiant aliment. The addition of water diminishes the density, and renders the cream more digestible. The tendency to acid may be removed, the solubility of the casein and the emulsion of the fatty matters insured, and both rendered more assimilable by the addition of half an ounce of lime-water to every half pint of the mixture.

Desiccated milks have not been used to a sufficient extent to enable us to judge positively of their fitness as an aliment during early infancy. Eggs approach very nearly to milk in their composition, and may be resorted to with propriety as an article of food for infants. The white, however, should be given as nearly as possible raw, or only heated to 130° F. Beyond this temperature it coagulates, and is then much more difficult of digestion. If the egg be put in boiling water for two minutes only, it will have merely a thin layer of albumen coagulated on its surface, and at the same time be warmed sufficiently throughout. Cow's milk contains 5.5 of casein per cent., the white of eggs as much as 11.1, the yolk 1.5, together 12.6. Eggs, therefore, should be diluted; and, with a little sugar of milk added, would form a very fair substitute for milk. Beef-teas, in whatever way prepared, are rather doubtful forms of aliment in the case of infants, while jellies are unassimilable: they only overload the blood with nitrogenous products, and thus impair its purity and its adaptedness to build up properly the several tissues.

It has been found that raw meat very finely shred, or scraped into a pulp will often be eagerly taken and always perfectly well digested by young children. Its use, however, is not recommended as an ordinary article of food, but only in cases of long standing diarrhœa. In many of these cases, apparently, it has been to it alone that the preservation of the life of the patient was attributable. Dr. R. considers it to be, probably, one of our most important remedial means in the treatment of defective assimilation. There is a danger attendant upon the use of raw beef as an article of diet unless there is a certainty it is in all respects perfectly healthy, and that is the generation by it in the human body of certain parasites, among which may be enumerated *tape-worm*, the *cysticercus*, and *trichina spiralis*.

In the infant as well as in the adult, variety is essential to the maintenance of health. There has long existed a prejudice, both in and out of the profession, in favour of vegetable food, particularly farinaceous, during the earlier periods of existence. The views upon which this prejudice is based are altogether erroneous. Vegetable food is neither easily digested, nor in the proper sense of the term, nutritious. To some extent the erroneous views in reference to this subject have been corrected by recent more accurate observations. According to Dr. R., the earliest period at which vegetable food can be borne is about the eighth month. "The teeth which appear," he remarks, "are not of value because they are then capable of mastication, but simply as evidence that changes have occurred in the organs of digestion, which have progressed *pari passu*, and that the salivary and pancreatic glands of the membranous stomach are in full development, and capable of digesting vegetable aliment. Then, and only then, therefore, as a rule, may vegetable food be given, and consequently weaning may be tried, if necessary." But even then only the most easily digestible vegetable substances should be allowed at first; and it is best to continue, also, in a great measure, the animal milks in combination.

In proceeding to consider the treatment of defective assimilation, Dr. R. refers again to the facts which prove the superiority of the mother's milk, or that of a proper nurse, for the nourishment of the infant, and its influence in the preservation of the health of the latter, even when its use is combined with injudicious hand-feeding, showing the importance, therefore, of securing, by every effective means, the natural aliment to the infant for as long a period as possible. Even in cases in which it is not secreted in sufficient quantity to furnish the entire nourishment of the infant, the mother should not be permitted to desist entirely from suckling; the deficiency of the nourishment supplied by her being made up in the mean time by artificial food of a suitable quality, while everything is done with the view to increase the flow of milk from the maternal breast.

The subject of defective lactation and its treatment is discussed by Dr. R. under three heads: 1st. When the defect arises from a state of hyperæmia from over-feeding, etc.; 2d. When it is attended with a weakened or anæmic state of the body; 3. When it results from torpor of the breast. The first variety is the least common and by far the most easily got rid of. The third is the most frequent; it is usually met with in middle-aged females, or those who have married at a late period in life, or who are somewhat masculine in form and character; it may result also from paralysis, mental emotions generally, disease of the female organs, with or without atrophy of the mamma, excessive obesity, impure air, and the neglect of regular lactation. In the first variety the remedies are a gentle purgative, a more simple, less exciting diet, the entire disuse of all fermented or distilled liquors; at the same time, care being taken that a due amount of nutritious matter be taken in order to prevent a complete suspension of the secretion of milk. The second variety calls for a nutritious diet, light stimulants and tonics; gentle daily exercise and a pure, free air. In many of the cases belonging to the third variety the deficient action of the mammary glands cannot be restored, in others, however, the supply of milk may be augmented by artificial suction or drawing of the breasts; by electricity; by a proper diet and regimen, certain local applications and perhaps galactogogues internally. Among the various articles included under this head Dr. R. distinguishes especially decoction of the leaves and stalks of the castor-oil plant, an infusion of fennel-seeds, etc. etc.

The remainder of the treatise is devoted to a consideration of the nature and treatment of the atrophy of infants resulting from errors in diet and regimen. According to Dr. R., it is the power of *primary* assimilation, or digestion in the alimentary tract only which is lost, while *secondary* assimilation, or the absorption and appropriation of assimilable matters, if such be present, may still be effected. It is, therefore, manifest that ordinary dieting will never suffice to restore the child. Starchy matters, which are so generally prescribed, should not be given. In the morbid condition under consideration these substances cannot undergo in the stomach the normal changes necessary to their proper assimilation. How far the same is true in respect to sugar must be determined by future inquiry. Glucose is probably occasionally digested in these cases. The albuminous matters, particularly the casein and oily substances that are taken, do not seem to be digested any better than starchy matters. Milk passes off by the bowels in many instances only curdled, but otherwise unchanged. This is a state of things peculiar to the disease under consideration; it is not met with in other analogous atrophies in infants, to the same extent at least. Even the attempt to feed the patients on breast-milk has failed: they seem neither able nor willing to take it.

It will be impossible for us to follow Dr. R. in the details of the treatment laid down by him for the form of atrophy in question. His suggestions in relation to the use of artificial gastric juice to aid the stomach in the solution and assimilation of albuminous substances, and of artificial pancreatic juice, or of the phosphate of soda to assist in the digestion of fatty matters, and perhaps of sugars also, are deserving of a careful examination. The emulsion of fats may be effected also, he remarks, by giving to the patient only the fatty acids of which they are composed, and which are readily absorbed into the system. The good effects of cod-liver oil are probably in some measure due to its excess of fatty acid. The same is true of butter. Many children, it is well known, grow fat upon bread and butter. They appear, indeed, to thrive on it when all other means fail.

To correct acidity of the alimentary canal Dr. R. recommends lime-water, and to counteract the flatulence and colicky pains, some light carminative, or, in severe cases, wine whey made by adding to two parts of boiling milk one of good sherry or port wine.

The best article of diet in these cases is the milk of the human female, or when this cannot be furnished at all, or only to an insufficient extent, that of the ass, goat, mare or cow. When the infant is to be fed on cow's milk, we should always endeavour to obtain it from an animal at grass. It should be given to the child diluted with water, one or two pints to one of the milk, according to the age of the child; diminishing of course the extent of dilution as the child becomes older. If two parts of water be used for dilution, sugar should also be added in the proportion of one to two drachms to every pint. To each pint of the diluted milk, from one to one and a half ounces of lime-water should be added to neutralize the amount of acidity present. Which amount may be generally determined either by testing the milk with litmus paper, or more accurately perhaps, by the symptoms observed in the child—frequent hiccough, and apparent griping especially after feeding, as evinced by an occasional cry, and sometimes the drawing up of the legs, followed generally by a loose greenish stool. Vomiting is usually present, the ejected matters having an intensely acid smell. These premonitory symptoms, if neglected, will be succeeded by confirmed diarrhœa. In these cases lime-water in excess is indicated. All admixtures of vegetable matters are improper excepting as correctives of bad milk.

Dr. R. gives proper directions for estimating and correcting inferior kinds of milk by arrow-root and cream. Occasionally, where diarrhœa is very obstinate, rice-water he directs to be substituted for ordinary water as a diluting medium.

Now and then, he remarks, not only is diarrhœa present, and intense debility, but also great irritability of stomach. No kind of food is retained, not even wine whey; even those substances, perhaps, which have hitherto agreed best with the child can no longer be borne. The best aliment in these cases, according to Dr. R., is *raw meat*. It often settles the stomach and alimentary canal when all else is rejected by vomiting. Dr. R., after some years of experience, has come to regard it as one of the best and surest remedies we possess in such cases.

We will now give, very nearly in his own words, the remarks of Dr. R. on the medicinal treatment of defective assimilation.

In the milder cases all that is required is a proper attention to diet and regimen. The occasional use of carminatives, with half a teaspoonful of castor oil when needed, and small doses of alkalies, will often remove the irritability of the alimentary canal. Cod-liver oil is usually beneficial; it may be given after meals, in teaspoonful doses, with the addition, if there is much acidity, of one, two, or more drops, according to the age of the patient, of liquor potassæ. In some cases, where there is indigestion, the oil may, with great advantage, be combined with from a half to one teaspoonful of the *essence of rennet*. In more severe cases, and if diarrhœa be present, Dr. R. pronounces the *nitrate of silver*, in doses of one-sixteenth to one-eighth of a grain, to be, without doubt, the best remedy; sometimes the *sulphate of copper* in similar doses proves effective. He places little confidence in catechu, logwood, chalk mixture, or opium. Anodynes he considers to be sometimes useful. Thus, when a child cannot rest or sleep, they are imperatively called for. The nervous child is over-excited—it needs to be calmed: two to five drops of tincture of henbane, in a teaspoonful of dill water, at night, will suffice. Often, after a week or ten days, the child will be found to rest without its further use. Opium is more certain, but it is, at the same time, a much more dangerous remedy in the case of infants. Dr. R. has seen two children killed by it; in one of the cases a single drop of laudanum constituted the fatal dose. He thinks, however, that when given in quarter-drop doses gradually increased and carefully watched, these unfortunate results from the use of laudanum will seldom occur.

Defective assimilation is sometimes attended with feverish excitement; which usually comes on at night, and is no doubt due in great measure to the gastric irritation. In such cases, we are assured, that external inunctions of oily or lardaceous substances prove most effective remedies. The rationale of the curative operation of these substances is not yet satisfactorily explained, but of the fact, according to Dr. R., there can be no doubt. Thus, if the child be completely rubbed over with a mixture of suet and sweet oil, of such a consistency as will allow it to remain on the surface, in about three hours' time, or even before, the skin will be found to have cooled and become soft; the anorexia to have disappeared, while often a quiet comfortable sleep will soon follow. The next morning the child should be washed in a warm bath. Two or three applications of the inunction, it is said, will generally effect a cure of the feverish excitement, and the irritation of the alimentary canal is usually at the same time greatly benefited. Dr. Simpson, of Edinburgh, has shown the good results derived from external inunction of cod-liver oil when the remedy could not be taken internally. When, in cases of defective assimilation, in connection with the emaciation, there are attacks of hectic fever, frictions of the surface with cod-liver oil will often remove both symptoms, and greatly improve the general health of the patient. *Milk baths* in cases attended with dyspepsia and great emaciation have been found most effective remedies. Dr. R. presumes that in these cases, absorption of the fatty and nutritive matters takes place through the skin. Nutritive injections are sometimes beneficial where food cannot be taken into or retained upon the stomach. Life has been prolonged by them until the irritation of the stomach has subsided, and aliments could be again taken in the ordinary way. Even cod-liver oil may be absorbed if given in an injection.

In respect to the treatment of the aphthæ by which defective assimilation is so often accompanied, Dr. R. remarks, that "the *mild form* will generally yield to borax and honey, weak solutions of alum, and the other remedies employed ordinarily in thrush. The other variety, the *malignant* or *contagious*, is a much more serious affection; it more closely resembles *diphtheria*, and requires an analogous treatment. Generally wine whey, or wine, should be given freely. As local applications, the only remedies which in my hands have cured have been, first, a weak solution of nitrate of silver, applied by means of a sponge all over the affected parts, twice or three times a day; secondly, the tincture of sesquichloride of iron, in strength varying from one part of the tincture in from seven parts to an equal quantity of water. In cases where the throat or nasal mucous membranes are covered with these aphthæ, I have used a fine syringe, and injected sparingly, either down the throat or up the nasal cavity, the weaker solution. * * * Such local and general treatment, however, must not supersede the hygienic. Pure air, isolation, the free use of disinfectants, and scrupulous cleanliness, are also needed; in fact, every measure is to be taken which will in any way prevent the development of that infantile hospital atmosphere which is always observed wheresoever many children are congregated together, and which proves invariably deadly in its effects."

We recommend an attentive perusal of the treatise of Dr. Routh by every physician. It is certainly replete with instructive facts and practical deductions regarding the proper feeding of infants—the morbid conditions resulting in them from improper and deficient nutriment, and the means best adapted for their correction. We know of no treatise in which these subjects—which are of the deepest interest to every medical practitioner—are treated in a more able and philosophical manner;—no one, indeed, which throws so great an amount of light upon every question connected with the proper dietary of the early periods of existence. Our anyalsis of it has been necessarily confined to a bare outline; it but imperfectly indicates the exceeding riches of the volume and the sound practical sense by which it is characterized throughout. D. F. C.

ART. XXIV.—*On the Signs and Diseases of Pregnancy.* By THOMAS HAWKES TANNER, M. D., F. L. S., Member of the Royal College of Physicians, etc. etc. 12mo. pp. 504. London, 1860.

IN this volume Dr. Tanner has presented a very fair exposition of the actual condition of our knowledge in regard to the subjects indicated on its title-page. Whether such a work was called for in order to supply a want in medical literature, or whether all it teaches was as fully and satisfactorily taught in the numerous publications already upon the shelves of our libraries, we shall not pause to consider. However this may be, it cannot be denied that the author has furnished to the obstetrical student and practitioner an admirable digest of all that is at present known in regard to the signs and duration of pregnancy, and the diseases which simulate it, the causes, phenomena, results, and treatment of abortion; the character of substances, besides the early ovum, occasionally expelled from the uterus, with the mode of recognizing each—as, for example, moles, solid and vesicular, menstrual decidua, and membranous formations from the vagina; extra-uterine gestation; superfœtation, and missed labour; the diseases which may coexist with pregnancy; the sympathetic disorders of the latter state, and the diseases of the urinary and generative organs, including displacements of the gravid uterus, liable to occur during gestation. The whole of these subjects are embraced in twelve chapters.

Each is illustrated, whenever it admits of it, by the history of many important and appropriate cases, either derived from the practice of the author himself, or borrowed, with due acknowledgment, from the writings of others.

The work of Dr. Tanner, in whatever light it may be viewed, is got up with great ability, and as a manual of the signs and diseases of pregnancy it has no superior, scarcely perhaps an equal. D. F. C.

ART. XXV.—*Relatorio do Gabinete Estatistico Medico-Chirurgico do Hospital Geral da Santa Casa da Misericordia e Enfermarias publicas*, Apresentado Ao Exmo. Sr. Marquez D'Abrantes, Provedor da Santa Casa, pelo Dr. LUIZ DA SILVA BRANDAO, Director do Gabinete Estatistico, etc. etc. Rio De Janeiro, 1860: 4to. pp. 62.

Report of the Department of Medico-Chirurgical Statistics of the General Hospital Santa Casa da Misericordia, and of the Public Infirmaries, etc. By Dr. LUIZ DA SILVA BRANDAO, Director of the Department of Statistics, etc.

ALTHOUGH somewhat deficient in the fulness and precision which are so essential to the value of all medical statistics, the series presented by Dr. Brandao are replete with interest. They present a tolerably favourable exposition of many of the leading facts connected with the diseases which prevail among the general population of the city of Rio De Janeiro, and its immediate environs.

The statistics presented in the report before us are for the first six months of the year 1860. During that period there were admitted into the hospitals of Rio Janeiro, 8,747 patients, while there remained in the wards, on the 31st of December, 1859, 932 patients, making the total number treated, from the first day of January, 1860, to the 30th of June of the same year, amount to 9,679.

The general mortality of the hospitals was 18 per cent.

The statistical tables before us embrace 1223 cases of *intermittent fever*, chiefly of the quotidian type; of these, 11 are reported to have terminated fatally. 101 cases of *typhoid fever*, of which 51 proved fatal. Of the eruptive fevers, there are reported to have occurred 114 cases of *smallpox*. Of these, 23 died. Only *two* cases of *varioloid* are reported; both recovered.

Of *yellow fever*, the statistics of 1,596 cases are given—1,482 males, 114 females; 108 infants, 837 youths, 585 adults, 66 aged; 1512 whites, 84 coloured; 187 were natives, 1,356 strangers, and 53 Africans. The deaths amounted to 495; rather more than 31 per cent. Of the fatal cases, 458 occurred in males, 37 in females, 30 in infants, 264 in children, 152 in adults, and 19 in aged persons; 485 in whites, and 10 in coloured persons; 7 in natives, 484 in foreigners, and 4 in Africans. 39 of the cases of yellow fever were, when received, in a dying condition; 72 died within the first 24 hours, and 86 within the first 48 hours.

506 cases of *pulmonary tuberculosis* were treated—388 males, 118 females; 27 infants, 261 children, 165 adults, and 53 aged persons; 379 whites, and 127 coloured; 109 natives, 362 foreigners, 35 Africans. The mortality amounted to 48.8.

In the general report preceding the series of statistical tables, under the head of *Yellow Fever*, there are some general remarks on the plan of treatment found most successful in the control of the disease as it occurred in Rio Janeiro.

From no treatment, Dr. Brandao remarks, was such beneficial results derived in cases of yellow fever, as from the administration in its early stage of sudorifics and purgatives. When the febrile reaction was very violent, a general bleeding was demanded, and when evident symptoms of gastric distress were present, an emetic of tartarized antimony. After the bowels had been cleared out by the employment of calomel and castor oil, the patient was placed on the use of sulphate of quinine, which was given until an entire resolution of the febrile symptoms occurred, when the employment of a lemonade made from some one of the mineral acids usually sufficed to complete the cure. When the disease had passed into the second stage, and vomiting of a bilious or black matter, or of blood took place, with suppression of urine, etc., cups, or a large blister, were applied to the epigastrium. Internally, may be administered tincture of nux vomica, ergotine, perchloride of iron, subnitrate of bismuth, and such other tonics and antispasmodics as the symptoms present would seem to indicate. Labarraque's solution may also be given by the mouth and by injection into the rectum.

Dr. Viega, Director of the Infirmary *Nossa Senhora da Saude*, has derived great advantage in the relief of the peculiar pain of the head which occurs in some cases of yellow fever, from the topical application to the frontal region of a solution of cyanuret of potass.

In a foot-note, again, we are told that the treatment generally pursued varied with the several periods of the disease. In the first stage, or within the first twenty-four hours after the invasion of the disease, the abortive treatment was the one most depended on. That is to say, the object had in view was, by the administration of mild but active remedies to procure large alvine evacuations, and to solicit an increased secretion of bile, and thus concur in effecting a decarbonization of the blood. From 18 to 20 grains of calomel were at first directed, followed at the end of two hours by from two to three ounces of castor-oil, which is to be repeated after a proper interval, so as to secure copious bilious evacuations. So soon as this has been effected the patient is to be put upon the use of a drink formed of a pint and a half of lemonade made from sulphuric acid, and half a drachm of sulphate of quinia; of this a wineglassful is to be taken every two hours.

When the reaction is very violent, and the patient of a plethoric habit, a bleeding from the arm will have the effect to render much more effective the above treatment. At the same time the application of cups to the gastro-hepatic region will be required to diminish the congested condition of the stomach and liver.

During three years, Dr. Brandao has pursued invariably the foregoing treatment, whenever he has had an opportunity of combating the disease in its primary stage, and he has rarely known an instance when such has been the case where the disease has passed into the second stage.

When the patients are received after the second day of the disease, the urine already commencing to become albuminous, the irritability of the stomach is such that the foregoing treatment can seldom be put in practice. The fluid magnesia of Murray, or the carbonate and citrate of magnesia, will sometimes be tolerated to an extent sufficient to promote bilious evacuations, at the same time the patient should be supplied with cold water or some refrigerant as a drink. Sometimes the quinated lemonade will be tolerated. In cases marked by a hemorrhagic tendency, or in which the black vomit has already set in, there is little chance of recovery. Occasionally, a large blister to the gastro-hepatic region, injections impregnated with the solution of Labarraque, and, by the mouth, the valerianate of quinia and camphor, small doses of magnesia, and cold and tonic infusions when the stomach will tolerate them, have occasionally been followed by an entire solution of the disease in even, apparently, desperate cases.

D. F. C.

QUARTERLY SUMMARY

OF THE

IMPROVEMENTS AND DISCOVERIES

IN THE

MEDICAL SCIENCES.

ANATOMY AND PHYSIOLOGY.

1. *On the Physiology of the Valves of the Heart.*—Ludwig Joseph, in a previous paper (*Virchow's Archiv.*, Bd. xiv.), gave a minute anatomical account of the valves of the heart, describing particularly the muscular nature of the various valves, which was discovered by Kürschner in 1840. Joseph observed in the venous valves muscular elements which proceed from the innermost muscular layer of the auricle, and extend into the valves for a third of their length, in the form of tongue-shaped expansions. This being the case, it is clear that the contraction of the auricles must also influence the position of the auriculo-ventricular valves; and since the contraction of the auricles begins at the entrance of the great venous trunks, the auriculo-ventricular valves participate in the auricular systole towards its termination. The effect of the contraction of the fibres in these valves is to draw them up like a curtain against the ostium venosum, so as to form around the ostia a low, firm, ring-shaped wall. The auriculo-ventricular orifices are at the same time somewhat enlarged by this contraction; and by facilitating thus the entrance of the blood into the ventricle, its chamber is more easily and completely filled. The action of these valvular fibres may be studied in the quite fresh heart of any animal, by applying to the interior of the auricle an induction current. The fibres of the heart are attached to the arterial rings in the great vessels, the aorta and pulmonary artery, whilst by the other ends they terminate in the cordæ tendineæ. Contraction takes place at both ends, and meets in the middle of the fibres. By the contraction of the musculi papillares in the centre of the auriculo-ventricular orifice, the points and edges of the valves are unrolled, and the occlusion is perfected. The pressure of the blood assists also to unfold and to stretch the valves. They form a somewhat convex floor to the auricles, and are prevented turning upwards by the influx of venous blood, and also by the cordæ tendineæ. The semilunar valves are much simpler. At the beginning of systole the valves are as far as possible removed from the sinuses of Valsalva; they are then separated by the ventricular contraction, and this is more easily accomplished than at first sight would appear, for the contraction of the arteries is already over. The valves are not pressed quite close against the arterial walls, as many seem to think, and blood therefore remains constantly between the valve and the arterial wall. It is this blood behind the valves which closes them, and not a returning wave. Of this the author has convinced himself by experiment.—*Ed. Med. Journ.*, April, 1861, from *Archiv. für Path. Anat.*

2. *Physiology of the Thymus Gland.*—According to Friedleben (*Die Physiologie der Thymusdruse*) the thymus increases in size up to the time of puberty; although after birth up to that time its size to that of the body is

relatively less. From puberty to manhood it is stationary; and after this it begins to disappear. Friedleben says the same thing occurs in the lower animals. Like Bischoff, Friedleben observed it to be occasionally absent in well-developed children. The juice of the thymus, Friedleben says, has always an acid reaction—which disappears when the gland begins to putrefy—and the ashes left after incineration are only in part soluble in water. They consist of chlorides, phosphates, and sulphates of soda, potash, lime, and magnesia. The organic matter is albumen, gluten, sugar, fat, colouring matter, and lactic acid. The quantity of ash is greater in the calf than in the ox; the thymus of a calf, ten days old, contains 10.226 per cent. of inorganic matter; whereas that of an ox, eighteen months old, has only 3.317 per cent. The quantity of water is also greater in the thymus of the calf. A rich diet, of albuminous, fatty, and saline food, increases the size of the thymus and the amount of its secretion; but an entirely fatty diet causes it to disappear. Starch diet first increases the secretion, then diminishes it, and at length causes atrophy of the gland, as happens in starved animals.

Friedleben found that extirpation of the gland is not fatal to young dogs; and that when both the thymus and spleen are extirpated the preparation of the blood and the nourishment of the body are defective; so much so that after a time all the animals operated on die of a species of inanition. When the thymus alone is removed the spleen increases in size. The urine is also found to be diminished in quantity.—*Sydenham Society's Year-Book of Med. Surg., &c.*, for 1859.

MATERIA MEDICA AND PHARMACY.

3. *Administration of Medicines.*—The following is the recapitulation of some interesting remarks by Dr. HENRY KENNEDY (*Dublin Med. Press*) on this subject:—

"1. To insure the full effects of any medicines, they must be given in larger doses than is at present done.

"2. As examples of this principle, sarsaparilla, benzoic acid, the dilute nitric acid, and the preparations of colchicum, may be mentioned.

"3. The adulteration of medicines, or the substitute of cheaper articles, is a common cause of their failure.

"4. The introduction of new medicines or preparations into practice tends to increase the difficulties of therapeutics, by enlarging the field for observation.

"5. In testing the effects of medicines, every care should be taken that the experiment is an exact one; and, when possible, the medicine should be given *per se.*

"6. When the nature of the substance admits of it, there are good grounds for believing the form of powder is the most efficacious in which it can be administered."—*British Med. Journal*, May 18, 1861.

4. *Use of Glycerine in the Internal Employment of Chloroform.*—M. BONNET gives (*Journal de Pharmacie*, March, 1861) an account of the various means he has tried of remedying the inconveniences which attend the ordinary mode of prescribing chloroform for internal use; seeing that, in consequence of its insolubility in ordinary vehicles, it is administered equably only with difficulty. He finds that mixing equal parts of chloroform and the finest glycerine in a mortar, until the droplets of chloroform cease to be visible, completely answers the end. When water or other adjuvant is added, a limpid fluid is produced, which exhibits no sign of separation, even when more than 100 parts by weight of the chloroform are added to distilled water. It is essential for this that the glycerine shall be perfectly pure. Sulphuric ether may be administered in the same way. For external application, chloroform should be combined in the same way, a larger proportion being caused to be taken up by more rubbing. This preparation of the chloroform prevents the painful irritation which sometimes ensues on its application.—*Med. Times and Gaz.*, April 27, 1861.

5. *Action of Chloroform.*—Dr. SANSOM read a paper on this subject before the Royal Medical and Chirurgical Society, April 12, 1861. The following are his conclusions: "1st. That chloroform-narcotism is due to the imperfect stimulus to the vital functions of a mal-oxygenated blood. 2d. That this mal-oxygenation is due to the direct influence of the vapour of chloroform upon the blood, and especially upon the blood-corpuscles. 3d. That the vapour acts caustically on the cell-walls of the blood-corpuscles, and thus impedes the endosmosis of oxygen. 4th. That if the blood be so deteriorated as to supply an insufficient stimulus to the heart, death is by syncope; whilst if stasis be primarily effected in the lungs, death is by apnœa"—*Med. Times and Gaz.*, April 20, 1861.

6. *Celandine as a Vulnerary.*—The ancients made great use of this plant; and it is probably unjustly neglected at the present day, since it possesses active principles which afford the presumption of unequivocal therapeutic properties, and require only the application of exact chemical experiment. Dr. SACC, chemist at Wesserling, has lately directed the attention of practitioners to the topical effects of the plant. According to him, the action of celandine as a vulnerary is greatly superior to that of arnica. In the south, the chelidonium majus is universally employed to prevent or subdue traumatic inflammations; and that, says M. Sacc. with a certainty which he has not witnessed in any other vulnerary. At Marseilles, where it is always found in full vegetation, it is the popular cure; and M. Sacc quotes several cases showing its excellent topical effects. In northern countries, he recommends the preparation of an alcoholic tincture of the leaves. Unless we are mistaken, however, the chemical analyses of MM. Chevalier and Lassaigne have proved that the root is more rich in the active principles; and it would therefore be preferable to employ that part of the plant.—*Ed. Med. Journ.*, March, 1861, from *Bull. Gén. de Thérap.*, Nov. 1860.

7. *Method of Making Endermic Applications.*—The following is M. TROUSSEAU's plan. He removes the epidermis by means of strong ammonia: but the application requires caution; if the ammonia be too long applied, it will leave a scar. A thimble is filled to four-fifths with cotton-wool, and then a little pledget soaked in the strong liquid ammonia fills up the remaining fifth. It is then placed on the part affected and kept in contact with the skin for a shorter or longer time. Two minutes suffice for its application behind the ear, three minutes on the temples, four to five on the neck. The mode of dressing the blister thus formed is the grand point. M. Trousseau never applies the salt, etc. in powder; he mixes the powder into a paste with a drop of water, in the palm of his hand, and then spreads it on the surface from which the blistered epidermis is wiped off. He then covers the application with oil-silk to keep it moist, and with diachylon. After twelve hours the dressing is renewed; but first the false membrane formed must be carefully removed, or absorption will not take place.—*Brit. Med. Journ.*, April 13, 1861.

8. *Distilled Water of Copaiba.*—Dr. E. LANGLEBERT employs a distilled water of copaiba, prepared according to the ordinary process, both for internal use and as a vehicle for substances to be injected in gonorrhœa. The dose is from five to seven ounces daily. It is borne well. For injection, he combines it with sulphate of zinc, tannic acid, tincture of catechu, etc.—*Bull. Gén. de Thér.*, March 15, 1861.

9. *Chlorate of Potash and Glycerine as a Topical Disinfectant.*—Experiments instituted at Bicêtre, under the direction of M. MARTINET, have demonstrated remarkable disinfecting properties in a mixture of chlorate of potash and glycerine according to the following formula: Chlorate of potash in powder, 2½ drachms; glycerine, 3 ounces; mix. This mixture has been shown, by repeated trials, to present, 1st. A marked disinfecting power, due perhaps to the change which it produces in the secretion, and the mode of action of the wound; 2d. The property of giving the pus, even when of a serous kind, a greater consistence, often like cream. This result is, perhaps, according to M. Martinet, a physical effect of the affinity of glycerine for water, which it subtracts from the pus; but

is partly due to the favourable modification which is produced in the suppurating surface. He is inclined to think that the preparation of glycerine and chlorate of potash may, by thickening the pus, tend to prevent the occurrence of purulent or putrid infection, which generally takes place in connection with suppuration of a serous and unhealthy character. An advantage of the glycerine is, that it prevents the dressings from sticking to the edges of wounds. According to M. Martinet, the glycerine chlorate of potash is not adapted for wounds or sores of a bright red colour, nor for those that are recent or of healthy appearance.—*Edinburgh Med. Journ.*, March, 1861, from *Bull. Gén. de Thérap.*, Nov. 1860.

MEDICAL PATHOLOGY AND THERAPEUTICS, AND PRACTICAL MEDICINE.

10. *Hypophosphites in the Treatment of Phthisis.*—Dr. JAMES RISDON BENNETT has given (*Med. Times and Gaz.*, Ap. 27, 1861) some interesting results of trials of the hypophosphites, recommended by Dr. Churchill in the treatment of phthisis, and relates twenty cases, taken without selection, of which he happens to have more or less complete notes treated by the hypophosphite of soda. Of these twenty cases there were only nine in which the disease did not steadily advance while under treatment, and of these, four only manifested any decided improvement, while of the permanency of the improvement of these four, Dr. B. has no proofs, he says, in any one instance.

"I have tried," he states, "the remedy in numerous other cases besides those of which notes have been preserved, but have not been able to discover that it has exerted any special influence on any one function of the body, unless, indeed, it be on the digestive function. In many instances the tongue has improved in appearance, and the appetite increased, while the patients have been taking the remedy. But I question whether this has not been as much from the abstinence from all remedies capable of deranging the stomach, as from any direct influence exerted by the phosphatic salt. Where the stomach has been irritable, or where the state of the system has been such that all tonics have more or less disagreed, and where, consequently, these have been abandoned, temporary improvement has often followed the exhibition of the hypophosphites. In many of these instances the patients would probably have been as well with a little lime-water, citrate of potash, or any other equally innoxious agent. And, indeed, it often enough occurs in the course of the treatment of phthisis, that patients are for a time, at least, better without any medicine, simply regulating their diet. But even assuming that the new remedy has been useful in allaying irritability of the stomach, or improving the digestion, such effects often result from small doses of the alkalies, and may, therefore, in all probability, be referred, in the instances in question, to the base, rather than to the acid with which it is combined. In some cases, increased secretion of urine followed the use of the remedy, but this increase was not more than might be accounted for by the subsidence of febrile disturbance. In no case did I find that the urine was rendered acid, but in some instances it became slightly alkaline, or neutral, where it had before been acid. In no instance was there any evidence of excitement of the pulse, or tendency to hæmoptysis induced, nor any direct sedative influence exerted on the local pulmonary irritation. Hæmoptysis has, indeed, occurred while the patients have been taking the remedies, but in circumstances not justifying the belief that the remedy had anything to do with exciting the hemorrhage.

"The hypophosphite of lime, I have said, has appeared to me, on the whole, more useful than the salt of soda. Lime-water is well known to be very useful in many cases of gastric derangement, attended by nausea, vomiting, or gastralgia, and I have lately given, with advantage, in many such cases, a saccharine solution of lime, prepared for me by Messrs. Warner and Barclay, according to a formula recommended by Dr. Clelland, in the *Edinburgh Medical Journal*, for August, 1859. In several instances where the irritability of both stomach and bowels has been such as to interfere with all treatment, and with the taking of the most simple food, and where, consequently the emaciation and debility have rapidly increased, I have found the saccharated solution of lime, in doses of from twenty to thirty minims, three times a-day, prove of signal service. And it has appeared to me to act, not merely as an antacid, but as a tonic. I think it, therefore, extremely probable that the hypophosphite of lime will prove in many cases a useful remedy in the treatment of phthisis, acting beneficially on the stomach and intestinal mucous membrane, and, as Dr. Churchill affirms, on the pulmonary mucous membrane, diminishing the expectoration, and giving tone to the capillaries.

"But I am bound to say, that I have seen no more evidence of any specific antitubercular action exerted by the salt of lime than by the soda salt. No one will be inclined to question the great value of tonics in the treatment of phthisis, and among the poor, or those who have either neglected or mismanaged themselves under the false notion that tonics and good living are not suited to the cough, and other symptoms attendant on phthisis, it is often marvellous to observe the rapid improvement, and, perhaps, apparent cures, that follow on the administration of tonics. But it is not less true, that we meet with many cases of phthisis where tonics are not borne, and where their action is even highly injurious. This is especially the case with steel, which is often very injudiciously given. A trial of the hypophosphites may be useful in elucidating the benefit that accrues, in many instances, from a temporary or even an entire, abandonment of all tonics, and adherence to regulated diet, and all the various hygienic means, of such paramount importance in the management of all cases of tubercular disease."

11. *Action of Liquor Potassæ upon Phthisis.*—In our No. for Jan. last, p. 261, we gave the results of some trials made by Dr. R. P. Cotton, Physician to the Hospital for Consumption, to ascertain the effect of hydrochloric acid on consumption. This careful observer has lately published (*Med. Times and Gaz.*, April 13th, 1861) some experiments on the (chemically) opposite treatment by a pure alkali, on the same number (25) of unselected hospital patients.

He "administered fifteen minims of liquor potassæ two or three times a day, sometimes slightly increasing each dose. Of the patients ten were males and fifteen were females; their ages varied from fifteen to forty years; eight of them were in the first stage, four in the second stage, and thirteen in the third stage of the disease.

"Of the twenty-five cases, two slightly improved; one greatly improved; and twenty-two appeared to be uninfluenced by the treatment. In only one instance, however, did it disagree with the stomach; in all the rest it seemed to be inoperative either for good or harm. In the two slightly improved cases quinine and iron were afterwards administered with a more satisfactory result; and in the one greatly improved, the liquor potassæ was changed for a vegetable tonic, without any alteration in the general progress. Eight patients gained slightly in weight; nine lost weight; and eight experienced no change in this particular.

"Of the twenty-two patients in whom the liquor potassæ seemed inoperative, nine improved under a change of medicine, some of them, indeed, to a marked extent; thirteen, however, experienced no amendment under the like change, being apparently in a condition of disease hardly amenable to any kind of treatment.

"With this result, it may be interesting to couple a statement contained in the preceding report, that four patients who had been deriving benefit under the influence of *dilute hydrochloric acid*, unhesitatingly declared that they progressed to a much less extent during the brief period in which this remedy had been experimentally changed for *liquor potassæ*.

"In the days of some of our professional ancestors, liquor potassæ enjoyed a considerable reputation as a remedy in phthisis, from its supposed so-called "deobstruent" action. Of late years, however, it has fallen, I believe, comparatively into disuse, and is not often prescribed, except perhaps to meet an occasional complication.

"To these experiments, as well perhaps as to some which have preceded them, it may possibly be objected, that the period of trial was not sufficiently prolonged. From a conviction, however, that the time spent within an hospital is too valuable to the patients to be unnecessarily sacrificed to experiment, it has always been my habit not to persist with any one treatment for a longer period than two or, at most, three weeks, whenever it appeared that the patient was deriving no benefit, or when it seemed probable that the use of some other medicine might be followed by a happier result.

"It would be foreign to the object of this communication to enter upon the action of any of the salts, either of potassa or the other alkalies. I may briefly remark, however, that for certain dyspeptic complications of phthisis, several of these rank very highly as remedial agents.

"From the preceding observations, coupled with the results already obtained from the use of hydrochloric acid, as recorded in my last communication, I think we may fairly arrive at the following conclusions:—

"1. That liquor potassæ, in moderate doses, rarely disagrees with consumptive patients, but is quite as rarely productive of any good effect.

"2. That the so-called tubercular *crasis* is very much more likely to be relieved by the mineral acids than by the alkalies."

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12. *Influence of Ozonized Cod-liver Oil on the Pulse.*—Dr. E. Symes Thompson read an interesting practical paper on this subject, before the Royal Med. and Chirurgical Society (Feb. 26th, 1861). He commenced by reminding the society of a paper by his father, Dr. Theophilus Thompson, published in the *Transactions*[1] (vol. xlii.), in which the attention of the profession was first drawn to this subject. He recorded the cases of about twenty patients at King's College Hospital, to whom the ozonized oil was administered. The usual dose was two drachms twice a day. Scarcely any effect was observed from doses of one drachm. The influence of the oil on the pulse increased in proportion to the dose in which it was given, the effect of half-ounce doses, two or three times a day, being more marked than that of smaller quantities. The following table exhibits, as simply and concisely at possible, the results:—

Table showing the Changes of Pulse under Ozonized Cod-liver Oil.

Name.	Sex.	Disease.	Time of taking Oil.	Pulse.	
			Days.	Before.	After.
J. P.	M.	Phthisis, first stage.	7	116	98
J. S.	M.	Ditto.	7	120	108
W. B.	M.	Tuberculous larynx.	21	112	92
M. H.	F.	Phthisis, second stage.	7	80	80
E. A. W.	F.	Ditto.	14	140	112
C. H.	F.	Phthisis, first stage.	14	100	104
R. N.	M.	Phthisis, third stage.	7	150	116
E. D.	M.	Phthisis, second stage.	7	138	112
J. O'D.	M.	Emphysema.	4	104	86
M. M.	F.	Phthisis, second stage.	5	140	108
E. R.	F.	Anæmia.	4	120	116
M. S.	F.	Phthisis, third stage.	2	94	92
E. H.	F.	Phthisis, second stage.	10	104	88
W. S.	M.	Phthisis, first stage.	7	104	104
P. R.	M.	Phthisis, third stage.	4	104	96
S. E.	F.	Phthisis, second stage.	20	120	92
G. M.	M.	Phthisis, third stage.	4	140	120
H. C.	F.	Phthisis, first stage.	2	108	95
W. H.	M.	Phthisis, first stage.	5	120	96
J. R.	M.	Phthisis, first stage.	9	120	98

[1] See No. of this Journal for Oct. 1859, p. 529.

The author also recorded the effects of ozone in another form. He had made use of the ozonized water (as prepared by Condy), and found its influence in retarding the pulse considerable. In reference to a belief still prevalent amongst some members of the profession that ozone was a high oxide of hydrogen, the author remarked that he had used the peroxide of hydrogen (prepared by Messrs. Bullock), and found that it exerted no special influence on the pulse, which was more often accelerated than retarded under its use, which seemed to corroborate the conclusions of Dr. Andrews, who showed (in the *Philosophical Transactions of the Royal Society*, vol. cxlvi. p. 1 *et seq.*) that ozone was not an oxide of hydrogen, but simply an allotropic modification of oxygen. Of the 20 cases in which ozonized oil was given, in 11 the pulse was reduced more than 20 beats a minute; in 4, upwards of 10 beats; in 1, no effect was produced; and in 1 only was any permanent acceleration observed, and this could only be fully accounted for by disturbing circumstances. Of the 7 cases in which ozonized water was given, in 3 the pulse was lowered more than 20 beats, in 3 about ten beats, and in 1 it was at one time retarded and at another accelerated. Dr. Thompson drew special attention to the importance of the inquiry as connected with the treatment of phthisis, since, in this disease, anything that could retard the excessive rapidity of the vital changes would likewise check the development and progress of the disease. He showed that this had long been realized by the profession, and mentioned several remedies that had been used for this end, especially digitalis, which, though useful in some cases, was greatly inferior to ozone, being both less certain in its action, and often dangerous, from its cumulative tendency; while ozone exerted on the heart, not a depressing, but a strengthening and invigorating influence. It was suggested that the explanation of the remarkable effect of ozone in phthisis might be found in the greater affinity which phthisical blood had with oxygen—an affinity which it also preserved when in the allotropic form of ozone. Before concluding, the author alluded to a paper recently published by a French physician, *On the Use of Ozonized Oil of Turpentine in Hemoptysis,* in which the suggestions made by Dr. Theophilus Thompson, in 1859, had been followed, and observed that he had himself prescribed turpentine with ozonized cod-liver oil in hemoptysis with much benefit.—*Med. T. and Gaz.*, March 9, 1861.

13. *Acetate of Lead for Pneumonia.*—Prof. Strohl, of Strasbourg, extols the use of acetate of lead in cases of pneumonia, as much preferable to antimony or any of the more ordinary plans of treatment. He prescribes the acetate of lead in repeated doses of from three to seven and a half grains. At the commencement, if the patient be plethoric, he orders a bleeding from the arm, but in most cases he is satisfied with cupping or leeches. As soon as the symptoms begin to improve, the lead is omitted, and resolution is left to nature, the patient's strength being, at the same time, supported by nourishing diet.—*Brit. Med. Journ.*, 27 April, 1861, from *Gaz. des Hôp.*, Feb. 28, 1861.

14. *Arseniate of Soda in Scrofula.* By Dr. Bouchut.—The manifestations of the scrofulous diathesis are all exceedingly inveterate, and the treatment directed for their cure is only too often unsuccessful. All forms of scrofula, however, are not equally obstinate. The tertiary forms, which appear as tuberculosis, are generally incurable; of the other forms, whether primary or secondary, those which affect the bones are especially tenacious and of long duration; and, in truth, it is only over the mucous, glandular, and cutaneous manifestation of scrofula, that therapeutics can exert any decided power. The author has used, in turn, all the medicines usually reputed anti-scrofulous: iodine, mercury, iron, baryta, bromine, extract of walnut leaves, cod oil, arsenic, etc.; but, of all these agents, the arseniate of soda has appeared to him to be, under the circumstances which he describes, the most energetic and the most efficacious. In suitable doses, arsenic is one of the best *tonics* and *corroborants* we possess; it is only in too large doses, or when its use is too long continued, that it deserves to figure as an *alterative.* As a tonic it is an admirable succedaneum of iron, quinine, and cod-liver oil; and is of great service in the majority of organic and nervous cachexiæ. In the scrofulous cachexia it is an excellent remedy; and under its

influence children ordinarily regain their appetite, strength, and colour. In such cases there is amelioration only; but the cases where it cures are those in which the diathesis has not as yet produced a cachectic condition, and where the local manifestations are superficial and confined to the skin, the mucous membranes, and suppurated lymphatic glands. Beyond these, in tuberculosis and the diseases of bones, it is only a good palliative. But, although thus limited, the therapeutic effects have considerable importance. It is no slight matter to be able to abridge the duration of a coryza, an ophthalmia, or the suppurations of glands, cutaneous ulcers, otorrhœas, leucorrhœas, etc., which depend upon the scrofulous constitution. The author possesses a number of facts relating to such cases, as well as to scrofulous perforation of the palate, reputed syphilitic, suppurating cervical glands (formerly called *écrouelles*), etc. The result in all of them was the same; a rapid cicatrization of the sores was always observed.

In all these cases the arseniate of soda was begun in doses of 5 milligrammes (1-14th grain), and increased at the end of a few days to 10, 15, and, finally, 20 milligrammes ($\frac{1}{4}$ grain). Beyond that dose, symptoms of gastralgia, vomiting, and diarrhœa are apt to come on, and should be guarded against. It may be given in gum julep, in Bordeaux wine, in syrup of cinchona, or syrup of gum. The following formula may be employed, and the medicine left in the charge of families, for use during several weeks: Syrup of cinchona, 300 grammes (℥x); arseniate of soda, 5 centigrammes (gr. j): one or two teaspoonfuls each day; each teaspoonful containing about 1 milligramme ($\frac{1}{70}$ grain) of the arseniate of soda. In this dose, and with the precaution of increasing it gradually, the arseniate of soda presents no danger. Its effects are, to increase the appetite and produce a richer sanguification, manifested by a ruddy colour of the skin, muscular energy, and an unmistakable appearance of health. Such results, says the author, are not to be despised in the case of scrofulous subjects, pale, emaciated, and exhausted by long suppurations and mucous discharges; and it is on these grounds that he recommends the arseniate. He does not propose it, however, as a specific, but only as a tonic or corroborant, which stimulates the appetite and imparts increased activity to the molecular nutrition of the tissues. In scrofulous constitutions, it is the slowness of the movements of nutrition, and of the exchange of the circulating materials, which gives the diseases their peculiarly chronic character. In this respect the arsenical medication is useful, as perhaps the cod-liver oil is also, by stimulating nutrition; and the results obtained should induce practitioners to have recourse to it. It must be noted, however, that the arseniate of soda is suitable only in scrofulous diseases of the cutaneous, mucous, and glandular textures. Its efficacy is doubtful in diseases of the bones; and it is only a palliative in the case of tertiary scrofula, that is, in tuberculization.—*Edinburgh Med. Journ.*, March, 1861, from *Bulletin Gén. de Thérap.*, Nov. 1860.

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15. *The Grape Cure.* By Dr. ARAN.—Grapes were used therapeutically by the ancients; but the special application of them to the treatment of certain classes of disease dates only about twenty or thirty years back, and is confined, as is well known, to certain localities of the Continent. The method is thus described: The grape cure, as understood in Switzerland and Germany, consists in making grapes the basis of the alimentation during an interval of time extending from two to five or six weeks. The cure itself may be strong or mild. In the *strong* cure, the arrangements are as follows: The patient rises very early in the morning, and, after having swallowed a large glass of cold water, he goes, if he has sufficient strength, into the vineyard, where he eats one or two pounds of grapes, pulled from the vines, and still wet with the morning dew; these he eats without bread, or, if his stomach has difficulty in supporting the grapes alone, he may take a small roll of half an ounce to two ounces. After this repast, the patient, according to circumstances, is either subjected to frictions over the whole body, or he takes a bath, or he engages in gymnastic exercises, or he simply takes a walk. At eleven o'clock, another repast, consisting of three or four pounds of grapes; after which again a walk; and at two o'clock a frugal meal, composed chiefly of herbs, with grapes for dessert. In the afternoon, another repast of grapes of three to four pounds. Lastly, before going to bed, from one to three

pounds of grapes are taken, with some very light food. The *mild* treatment differs from the preceding or strong cure, only in the smaller amount of grapes which the patient takes, the quantity being reduced, according to the case, to one-third or one-fourth; and, besides, a little meat, not too fat, is allowed at the midday meal, and a cup of coffee or chocolate in the morning. In both kinds of cure much stress is laid upon the regimen. Patients are strictly forbidden to take milk, or food made with milk; all kinds of fat meat, eggs, vegetables, and every kind of fruit except the grape, are prohibited; the day must be regularly employed, with moderation both in drinking and eating; no excess of any kind is permitted; and frequent baths are taken. When the cure is finished, patients should continue the same kind of life during several weeks—eight or ten; which constitutes what the Germans call the after-cure (*Nach-cur*). The grape used must be perfectly ripe; and different kinds are used in different countries—the chasselas grape in most parts of Germany and Switzerland, the muscatel grape in the southern countries. The season best adapted for this treatment is the after-season, the middle or end of October, not only because at that time the grape is perfectly ripe in favourable years, but also because the air is then cooler and more pure, and the patients are less exposed to the heat of the sun when they are out in the vineyards, and because the temperature admits of long walks and gymnastic exercises. The localities selected for these special modes of cure, of which the number is very considerable at the present day, are, for the most part, admirably chosen, both as regards the purity of the air, the beauty of the situation, and the exposure, which shelters them from sudden chills of temperature. We have only to mention Veytaux, Montreux, and especially Aigle, on the borders of the Lake of Geneva; on the banks of the Rhine or its vicinity, Armenhausen, Bingen, Boppart, Laubbech, and Rüdesheim, Saint Goar; Méran in the Tyrol, etc. All acquainted with these countries will understand how many favourable influences are at work, in addition to the simple "grape cure." Theoretically, the grape cure has been attempted to be explained on the same chemical principle as the whey cure—viz., that, containing very little nitrogen, it was adapted for diseases with predominance of that element. But this explanation rests on no ascertained grounds. The grape cure has been much vaunted in chronic diseases, phthisis pulmonalis, scrofula, gout, diseases of women, diarrhœa, and (what appears very opposite) abdominal plethora, hæmorrhoids, hypochondria, etc. M. Aran is of opinion that, as a kind of aliment of very easy digestion, the grape cure may be serviceable in many diseases, but especially in dyspepsia, and other affections of the digestive organs, where it is important to give rest to the intestinal canal, while furnishing, at the same time, a kind of diet sufficiently nutritious and slightly stimulant. The hygienic conditions of the localities are, also, undoubtedly favourable for most chronic diseases; and the author thinks that the plan might with advantage be tried in France, so as to ascertain its real value. In the meantime, he is not disposed to allow any specific influence to the grape diet, in the cure of these cases, and recommends a cautious reserve. Fashion, he adds, has had more to do with it than science; and what she has raised up one day, she may overturn the next.—*Edinburgh Med. Journ.*, March, 1861, from *Bull. Gén. de Thérapeutique*, Oct. 1860.

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16. *Typhoid Fever and its Treatment.*—Professor Pfeufer, of Munich, has published an analysis of the cases of typhoid fever admitted into his clinique during the winter six months of 1856–7. The cases amounted to 231, a number which indicates about the ordinary prevalence of the disease in Munich. Of the 231 cases, 119 were of a slight nature, while 112 were severe; and among these last there were twenty deaths. In seven of the cases there was a distinct relapse of the fever, and four of these seven cases died. After death, two sets of ulcers were found in the intestines, corresponding to the two paroxysms of the fever. In five of the fatal cases, there was intestinal perforation; and it is worthy of notice, that in two only was the perforation situated in the ileum. In two cases, it was in the colon; and in one, in the appendix vermiformis. In a sixth case, there were all the symptoms of perforation; but the patient, a boy aged 14, recovered under the use of large doses of opium. In one case, there was laryn-

gitis, causing urgent dyspnœa; tracheotomy was performed, and the patient recovered.

The treatment consisted in the frequent administration of Liebig's infusion of beef. No mention is made of wine. Tincture of castoreum was prescribed when there was impending paralysis of the lungs; and the golden sulphuret of antimony when there was bronchitis, with scanty and difficult expectoration. Diarrhœa was treated with opiate enemata, and with tannin, rhatany, and alum, by the mouth. Alum, although a less powerful astringent than tannin and rhatany, was in most cases preferable, from its never causing vomiting. For intestinal hemorrhage and the symptoms of perforation, opium in large and repeated doses was employed. (*Zeitsch. für Rat. Med.*, 3 ser., bd. v. No. 2 and 3.)

M. Frémy believes that he has obtained great advantage in the treatment of typhoid fever by rubbing in croton oil over the abdomen during the second week of the disease. From fifteen to thirty drops of the oil, made into an ointment, are to be rubbed in night and morning, until an eruption is produced. This application is preferable to blisters, as being devoid of the risk of gangrene. Of one hundred and twenty cases where this treatment was resorted to, only nine terminated fatally, and two of the nine patients were moribund when they came under observation. (*Repert. de Pharm.*, Oct. 1860.)

Lastly, Dr. H. Ahnes strongly recommends the administration of sulphureous and chalybeate mineral waters in the treatment of typhoid fevers.—*British Med. Journ.*, April 6, 1861.

17. *Researches on Asphyxia; with Observations on the Effects produced by the Hot Bath in Asphyxiated Animals, and its Use in Restoring Suspended Animation.*—A paper on this subject, by Dr. A. T. H. WATERS, of Liverpool, was recently (May 14th) read before the Royal Medical and Chirurgical Society. Amongst the numerous researches which had been made with reference to asphyxia, the author was not aware that any had been directed to one of the subjects he had investigated. Physiologists are agreed as to the order in which the arrest of the vital actions takes place in asphyxia, but not as to the duration of the heart's action, nor yet as to the best mode of treatment in suspended animation. The different societies, whose aim is to save life, issue rules of the most opposite character for the restoration of those apparently dead. Two important points remain to be decided: first, the period after asphyxia has commenced during which treatment is likely to be successful in restoring animation; and, secondly, the value of the hot bath as a remedial agent. Experiments had been instituted by the author with reference to the following questions: 1. How long does the heart continue to beat in asphyxia? 2. What are the effects of the hot bath on an asphyxiated animal—firstly, after all respiratory movements have ceased, and are not re-excited; secondly, when respiration has been re-excited, and is being feebly carried on? It is difficult to decide with any degree of certainty with regard to the first question. Certain circumstances tend to throw a doubt on the generally received opinion, that "in asphyxia the movements of the heart cease in a few minutes after the cessation of the functions of animal life." The second question is more readily answerable, but the author was not aware that any experiments bearing directly on it had been performed previous to his own. The subjects of experiments were dogs, cats, and rabbits. They were drowned in water varying in temperature from 40° to 50° Fahr., and in one instance 36°. On being removed from the water, after every external symptom of life had disappeared, they were opened by the removal of the anterior part of the chest, so that the movements of the heart could be observed. Some of the experiments were parallel—*i. e.*, two animals of the same age and size were chosen, and after being drowned in the same way, were opened at the same time; the difference being that one animal was, previous to being opened, put into the hot bath at 100°, and the other was left exposed to the atmosphere. The number of animals experimented on, as just mentioned, was 28; of these, two being set aside which were submerged for an hour, in 18 the heart was found beating when first observed; in 8 its action had ceased. The animals were opened at periods from the commencement of asphyxia varying from the fifth

up to the thirteenth, and in one instance the twenty-first minute. The average period during which the ventricles continued to contract was nineteen minutes; the longest period was in a rabbit—forty-five minutes. With regard to the first portion of the second question, the morbid appearances of the animals put into the hot bath were compared with those of the animals not so treated. In the animals put into the bath, the lungs were much more congested, more full of blood; they were firmer in substance and specifically heavier than those not so treated. Both sides of the heart were loaded with blood. In some instances the blood was coagulated in the vessels of the lungs, the systemic veins, and the cavities of the heart. The blood was generally less fluid than in the animals not put into the bath, and coagulated more rapidly when removed from the vessels. In no instance did the bath produce a respiratory effort or any movement whatever on the part of the animal; it seemed further to shorten the duration of the heart's action. With regard to the second portion of the second question, experiments of the following character were performed: Animals were drowned in water from 45° to 50° Fahr.; they were kept under water, some for one minute, some for one minute and a quarter, and one for two minutes. When removed from the water they were placed on the table, exposed to the air. They soon began to breathe feebly. In order to compare the effects of the hot bath with those where all treatment was omitted, some of the animals were left to themselves, others were put into the bath as soon as respiration had been re-excited. Thirteen experiments were performed—twelve on rabbits, one on a cat. Of the thirteen, seven were put into the hot bath; of these, six died, at periods varying from two to twenty hours after submersion. Six animals were left to themselves; of these, four recovered and two died, both between the eighth and twentieth hour after submersion. The animals which had died after being put into the hot bath presented the following morbid appearances. The lungs were dark-coloured, full of blood, firm, almost liver-like in appearance. In some instances, portions sank in water; the air-tubes were empty; there was blood in all the cavities of the heart, in one instance coagulated. In the animals which died after submersion, but which were not put into the hot bath, the lungs were somewhat firm and congested, but to a less extent than in the others. The experiments appear to the author to be sufficient to establish the principle of the injurious influence of the hot bath, both when asphyxia is complete, and when recovery is commencing. In the former case, the bath momentarily increases the circulation; but respiration being in abeyance, the lungs become loaded with blood, and the left side of the heart distended. In the latter case, respiration being imperfect, engorgement of the lungs takes place, and subsequent arrest of the heart's action. The following conclusions are drawn by the author from his experiments: 1. That in asphyxia by submersion, the ventricles of the heart do not, as a rule, cease to contract "in a few minutes after the cessation of the functions of animal life," but that in many instances their action continues for a very considerable period, and that this serves to explain how recovery has taken place after lengthened submersion. 2. That in cases of asphyxia where respiration has altogether stopped, the effects of the hot bath are: to produce an accumulation of blood in the lungs and in the left side of the heart, together with a tendency to coagulate on the part of the blood; that it does not tend to prolong the action of the heart, but rather to paralyze its movements, and diminish the duration of its contractions; that it does not excite respiratory efforts, and prevents artificial respiration being properly carried out. 3. That in cases of asphyxia where respiration has been re-excited and is being feebly carried on, the hot bath, although in some instances it seems to have no immediate bad result, yet has a tendency to produce a fatal issue some hours after its use, by causing extreme congestion of the lungs, together with consolidation and collapse of the pulmonary tissue. The following practical inferences are drawn from the above conclusions: 1st. That efforts to restore animation should be made in all cases where asphyxia has not been of very prolonged duration. 2d. That the prolonged use of the hot bath in asphyxia is not only inefficacious, but dangerous; and that its temporary use appears to be attended by no direct benefit. So far as any means similar to that of the hot bath are likely to produce respiratory movements, the alternate dashing of hot and cold water on the body is probably the most efficacious. 3d. That it appears safer practice to omit all artificial treatment, when respiration is going on feebly, than to make use of the hot bath. 4th. That in the treatment of asphyxia all efforts should be primarily directed to restoring, or continuing, the respiratory movements; and all measures tending to load the lungs or embarrass the respiration should be avoided. The author believes that the best method of performing artificial respiration we are yet acquainted with is that recommended by Dr. Marshall Hall.—*Med. Times and Gaz.*, May 25, 1861.

[At a subsequent meeting (May 28th) of the society, a letter was read from Sir BENJAMIN BRODIE, relative to the above paper. The letter referred to the question of the continuance of the heart's action in cases of asphyxia. Sir B. Brodie had never in his experiments on the subject known the rhythmical contractions of the heart to continue for more than four minutes and a half after complete submersion: and believed that if they had once ceased in asphyxia they could not be restored. Cases of recovery after a longer submersion he attributed to the action of the heart having previously ceased in a state of syncope.

The late Dr. Thomas Harris, U. S. Navy, stated to us some years since, that he had never known an instance where a person had been actually submerged over five minutes, in which life had been restored.]

18. *Cerebral Circulation in Asphyxia.*—Prof. ACKERMANN, of Rostock, has lately arrived at some remarkable results, from experiments made with the object of ascertaining the condition of the cerebral circulation in asphyxia. These experiments consisted in removing a portion of the skull of an animal, by means of a small trephine, and substituting a piece of glass. After an interval of about twenty-four hours, asphyxia was induced by strangulation, by submersion, by compression of the thorax, by injection of water into the trachea, or by some other plan. The condition of the brain was then watched through the glass plate.

The result of these experiments is, that asphyxia was invariably found to be accompanied by a condition of anæmia, instead of congestion, as is generally believed to be the case. The anæmia was always greatest when the animal was asphyxiated in such a position that its head was higher than the trunk, and least when the animal was suspended by its lower extremities. In the former case, it was as pronounced as that which is observed when an animal has bled to death from the carotids. The congestion of the cerebral vessels, which is not unfrequently met with after death from asphyxia, Prof. Ackerman believes to be attributable to hypostatic hyperæmia of a *post-mortem* character, favoured by the fluid condition of the blood, which is usually observed in asphyxia.—*Brit. Med. Journ.*, 27 April, 1861, from *Archives f. Path. Anat.*, tom. xv.

19. *Diabetes resulting from Disease of the Floor of the Fourth Ventricle.*—Two cases of diabetes are recorded in the *Gaz. des Hôp.*, for March 2d, 1861, where softening was found after death in the anterior wall of the fourth ventricle. The part of the brain which was diseased corresponded to the place of origin of the pneumogastric nerve; and hence such cases, of which there are now a considerable number on record, tend to confirm the views of Professor Bernard as to the influence of the par vagum over the formation of sugar.—*Gaz. des Hôp.*, March 2, 1861.

20. *Quinine in Scarlatinal Dropsy.*—Dr. HAMBURGER concludes a long paper on scarlatinal dropsy by giving his experience of the use of quinine in that morbid state. He has given it in forty-seven cases, in forty-four of which improvement took place immediately or in a few days; in three there was no change either for better or for worse. The effects observed are, diminution of the febrile symptoms of the subacute stage, increased secretion of urine, which becomes clearer, reabsorption of exuded matters, even removal of already formed abscesses, and return of the appetite and strength. The urine, however, continues albuminous for some time; but this does not interfere with the progress of convalescence. Dr. Hamburger, in summing up his observations, says that

the action of quinine in scarlatinal dropsy is most productive of good results, and most rapid in the chronic stage: here improvement sets in almost immediately after the first doses. At the commencement, so long as the acute stage is present, the quinine may be delayed for some days, if the danger be not pressing. On several occasions, Dr. Hamburger has seen the patient remain for several days in the same state, or even gradually become worse; the urine becoming darker and the exudations increased. But, when quinine was fearlessly given, a happy result followed. If marked improvement do not appear after the medicine has been given four or five days, it is to be omitted; but even in this instance it should not be regarded as being useless, as the specificity of the disease appears broken by it. The dose is gr. iss to gr. ij twice a day for children; and for adults gr. iij or gr. iv. During the use of the quinine, great attention must be paid to the diet; especial care being taken not to overload the irritable intestinal canal with slops.—*British Med. Journal*, May 18th, 1861, from *Prag. Vierteljahrschrift*, 1861.

21. *Two Ounces of the Wine of the Seeds of Colchicum accidentally taken by a Gouty Subject with Relief.*—Dr. Joseph Bullar, Physician to the Royal South Hants Infirmary, records (*Edinburgh Med. Journ.*, March, 1861) a remarkable case of this.

The subject of it was a gentleman, 34 years of age, whose father and grandfather were gouty, and he himself, from youth, had suffered severely from frequent attacks of gout. Feeling out of order, he had taken a blue pill on going to bed, and intended to take black draught the next morning; but his servant gave him instead two ounces of the wine of the seeds of colchicum. The mistake was not discovered until accidentally two hours had elapsed, when a physician was sent for, who considered it too late to use the stomach-pump, and expressed the belief that the overdose would work itself off by violent vomiting and purging, and advised that a dose of black draught should be at once taken, and another in an hour and a half. This was done, and the patient in the afternoon, while taking a drive, was taken with vomiting, which continued incessantly for eight hours. The singular points in this case are, that there was no vomiting until seven hours after two ounces of colchicum wine were taken, and then violent vomiting for eight hours, with no ill effects except nervous weakness for the next day; but, on the contrary, with relief, for the last 24 years, of those severe and painful attacks of gout to which he had been subject for 10 years before.

SURGICAL PATHOLOGY AND THERAPEUTICS, AND OPERATIVE SURGERY.

22. *Statistics of Amputation.* G. F. Cooper and T. Holmes, Esq., give (*Med. Times and Gaz.*, April 6, 1861) the statistics of amputations performed in St. George's Hospital during seven years. The total number of amputations is 149, and the mortality 41 or 27.6 per cent.

There were 76 amputations of the thigh, of which 25, or 32.9 per cent., died; 40 of the leg, of which 13, or 32.5 per cent., died; 22 of the arm, of which 3, or 13.7 per cent., died; and 11 of the forearm, all of which recovered.

Amputations of the Thigh.—Of the 76 amputations of the thigh, 51 are classed as "pathological," of which 13 (25.6 per cent.) died, and 12 as "of expediency," of which 5 (41.6 per cent.) died. Putting these together, we should have 63 cases with a mortality of 18 or 28.5 per cent. The traumatic amputations amount to 13, of which 7, of 53 per cent., died; of these 9 were primary, of which 5 died, and 4 secondary, of which 2 died.

Causes of Amputation and of Death.—Of the 51 cases classed as pathological, 8 were performed on account of abscess in the knee-joint; of these 5 died, one of sloughing of the stump and phthisis, and 4 of pyæmia. 35 were for chronic affections of the knee; of these 5 died—2 of pyæmia, as proved by post-mortem examinations; in 2 others, pyæmia was inferred from the symptoms during life; the fifth from phthisis, with sloughing of the stump.

The 8 remaining amputations were performed for various diseases: 2 for malignant disease, 2 for gangrene after ligature of the femoral artery, 2 for necrosis, 1 for arterial hemorrhage in phagedena, and 1 for necrosis and abscess after excision of the knee; of these 3 died, 1 of exhaustion, 1 of secondary hemorrhage, and one of pyæmia.

Of the 12 cases classed under the head of "amputations of expediency," 9 were on account of tumours, 2 of loss of skin after diffuse cellular inflammation, and 1 on account of old contraction of the knee with atrophy of the leg; of these 5 died—3 of pyæmia, 1 of exhaustion, and one of secondary hemorrhage.

Of the 13 traumatic amputations, 9 were primary, and 5 of these died—2 from pyæmia, 2 from shock, and 1 from other injury, viz., rupture of the bladder; this case should perhaps be omitted in estimating the mortality.

Of the 4 secondary amputations of the thigh, 2 died both of pyæmia.

So that of the 25 deaths after amputations of the thigh, we have as the causes:—

Pyæmia (in two cases only inferred from the symptoms during life)	16
Secondary hemorrhage	2
Phthisis	2
Exhaustion	2
Shock	2
Other injury	1

Amputations of the Leg.—The total number of amputations of the leg is 40, 31 being for disease, viz.—27 "pathological," and 4 "of expediency;" and 9 traumatic, 6 primary, and 3 secondary.

Of the "pathological," almost all were performed on account of chronic disease of the bones of the foot and leg; those for acute disease of the ankle-joint being only 3 in number, of which 1 died. Of the remaining 24, 8 died—4 from pyæmia, 1 from exhaustion, and 3 from the effects of strumous disease in remote parts of the body, the lungs, brain, and kidneys. Of the "amputations of expediency," 2 were performed on account of painful stumps of former amputations (in the same limb), and 2 for tumours; all these recovered. Of the 9 traumatic amputations, 4 died—viz., 3 primary and 1 secondary—2 from pyæmia, 1 from secondary hemorrhage, and 1 from exhaustion.

Amputations of the Arm.—The whole number of these amputations is 22; 14 for disease, of which 2 died, and 8 for accident, of which 1 died. Of the former class, 10 are put down as "pathological," all have been operated upon for disease of the bones or of the elbow-joint, where some contra-indication existed to excision. Of these 2 died, both of pyæmia. 4 are classed as operations "of expediency," 3 on account of the effects of burn, and 1 (at the shoulder-joint) for malignant tumour of the humerus. All recovered. Of the traumatic amputations, 6 were primary and 2 secondary. 1 of the former died of pyæmia.

Amputations of the Forearm.—These are 11 in number, and all were successful. 6 were performed on account of disease of the hand, etc., 1 ("of expediency") for a tumour, and 4 were primary amputations.

Comparative Mortality of the Various Classes of Amputations.—Pathological amputations amount on the whole to 94, of which 24, or 25.5 per cent., died; amputations of expediency to 21, of which 5 died, or 23.8 per cent.; primary amputations to 25, of which 9, or 36 per cent., died; and secondary amputations to 9, of which 3, or 33.3 per cent., died. These figures, as far as they go, do not bear out Mr. Bryant's statement, that "amputations of expediency" are much more fatal than "pathological," and secondary than primary amputations. The list, however, is not sufficiently long to justify any very positive deductions.

Comparative Mortality of Circular and Flap Operations.—Of the 149 operations of which our table consists, 46 were flap amputations and 97 circular. Of the remaining 6, 3 were not noted as to this particular, and 3 cases of Syme's amputation are excluded. The results were as follows: Of 74 amputations of the thigh, 52 were circular, 15 of which died, showing a mortality of 28.8 per cent.; 22 were flap, and 10 died, showing a mortality of 45.4 per cent.

The shortest period between the operation and the patient's discharge from the hospital was, in the circular, 23 days, and in the flap 24 days; the longest in the circular, 126, and in the flap 105 days; the average period of cure in the circular 60, and in the flap 42 days.

Of 37 amputations of the leg, 21 were circular, of which 3 died, a mortality of 14.2 per cent.; 16 were flap, and 8 died, a mortality of 50 per cent. With respect to the period of their stay in the hospital, the shortest period was in the circular operations 19, and in the flap 20 days; the longest, in the circular 120, and in the flap 94 days; the average, in the former 49, and in the latter 46 days.

It ought to be noted that, in estimating these flaps for the flap operations, the details of one case are excluded, in consequence of its exceptional character. It was that of a man who submitted to amputation of the leg twice, on account of irritable and painful stump. The foot had originally been removed by Syme's amputation at another hospital, and the leg was twice amputated at St. George's. On each occasion he was kept in the house a long while, on account of the painful and irritable condition of the integuments. It appeared unfair to represent the delay which this unusual state of parts occasioned as a result of the mode of amputating.

Of 22 amputations of the arm, 17 were circular, of which 2 died, a mortality of 11.8 per cent.; 5 were flap, of which 1 died, a mortality of 20 per cent. The shortest period in hospital was, in the former, 20, in the latter, 26 days; the longest, in the former, 96, in the latter, 70 days; the average of the former, 41, of the latter, 51 days.

Of 10 amputations of the forearm, 7 were circular and 3 flap; none died. The shortest time in the hospital was, in the former class, 20, in the latter, 17 days; the longest, in the former, 142, in the latter, 50; the average of the former, 44, of the latter, 29 days.

This shows that out of 97 circular amputations of all kinds, 20 died, a mortality of 20.6 per cent.; while out of 41 flap, 19 died, a mortality of 41.3 per cent., or just double that of the circular, and that this excess of the mortality of the flap over the circular prevailed in all classes of amputations. More extensive data are required, however, to prove beyond question that this excess is constant, and, if so, clinical observation must be called in to show the cause upon which it depends. It may be conjectured that sloughing of the flaps would be a frequent cause of death after the flap operation; but our data do not entirely bear out this idea, nor are we prepared, at present to point out any decided difference in the causes of death after the two kinds of amputation. The list of flap amputations comprises 8 in which the flaps were formed after Mr. Teale's method—by the rectangular incision. In several of these cases the long flap sloughed, and 3 out of the 8 cases proved fatal. It should, however, in justice to the respected author of this operation, be remarked that some of these patients were in bad health at the time of operation. The flap operation appears (especially in the thigh) to have some advantage in respect of rapidity of cure.

Influence of Sex.—Of the 149 patients comprised in these tables, 118 were males, and 31 females. The mortality was 34, or 28.8 per cent., of the former, and 7, or 21.9 per cent., of the latter. If we remember that males are far more frequently the subjects of traumatic amputations, and that these are far more fatal than operations for disease, we shall come to the conclusion, probably, that females bear the operation worse than males. Of the whole number (34) of traumatic amputations, only 2 were performed on females.

Influence of Age.—For the purpose of estimating the influence which age exerts on the mortality, the cases may be divided into four groups: those occurring in childhood, or below the age of 15; in youth, or from 15 to 25 years of age; in adults, between 25 and 60; and in advanced life, beyond the age of 60.

In children, below the age of 15, we find 18 operations, of which 2 died; but as one of these was the result of other and necessarily fatal injuries, it would be more correct to exclude this case, and say that of 17 operations, 1 died of pyæmia.

In youth, 45 operations are recorded, of which 6 died, or 13.3 per cent.

In adult age, 80, 31 of which died, or 38.7 per cent.

In old age, 6, 2 of which died, or 33.3 per cent.

Thus we see that in children amputation is ordinarily successful; the only death recorded, excluding the case above referred to, was in a strumous boy on the limits of the prescribed age, with abscess in the knee-joint. In youth the proportion of deaths is far less than in adult age. In old age, there is no reason to conclude that the patients, *cæteris paribus*, bear the operation worse than adults, but our figures are too small to draw any conclusions.

The Causes of Death.—The total number of deaths was 41. The assigned causes of death are as follows:—

Pyæmia	in	24	cases,	or 58.5 per cent.
Exhaustion (without hemorrhage)	in	7	"	or 17 "
Exhaustion with secondary hemorrhage	in	4	"	or 9.7 "
Visceral disease	in	4	"	or 9.7 "
Diffuse inflammation and gangrene	in	1	"	or 2.4 "
Other injuries	in	1	"	or 2.4 "

In 9 cases no post-mortem examination was made; of these the causes assigned from the symptoms during life, were—pyæmia in 5 cases, exhaustion in 3, and secondary hemorrhage in 1.

Thus, it will be seen that in our experience, pyæmia occupies a much larger space as a cause of death, than in Mr. Bryant's table: while exhaustion (without secondary hemorrhage) is proportionately diminished, appearing as 17 per cent. only, while in the Guy's Hospital records it stands for 33 per cent. of the fatal cases. In Mr. Bryant's paper, no mention is made of the authority on which his statements rest; whether all or what proportion were examined after death, whether the cases produced include all the operations during a certain period, and if so, what period, with other interesting particulars. Thus, in this instance, it would require very strong evidence to convince us that one out of every three fatal cases of well-selected amputations died of mere exhaustion.

If we separate the amputations, on Mr. Bryant's plan, into "pathological," "amputations of expediency," "primary," and "secondary," we find the causes of death in each class as follows:—

Of 94 "pathological amputations," 24 died, the causes of death being—

Pyæmia	14 or 58.3	per cent. of the fatal cases.
Exhaustion	3 or 12.5	" "
Secondary hemorrhage . . .	2 or 8.3	" "
Visceral disease	4 or 16.6	" "
Gangrene from diffuse inflammation	1 or 4.2	" "

Of 21 "amputations of expediency," 5 died—3 of pyæmia, or 60 per cent.; 1 of exhaustion, or 20 per cent.; and 1 of secondary hemorrhage, or 20 per cent. of the fatal cases.

Of 25 primary amputations, 9 died—5 of pyæmia, 55.5 per cent.; 1 of secondary hemorrhage, or 11.1 per cent.; 2 of shock, or 22.2 per cent,; and 1 of other injuries, or 11.1 per cent.

Of 9 secondary amputations, 3 died—2 of pyæmia, or 66.6 per cent.; and 1 of exhaustion, or 33.3 per cent.

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23. *Excision of the Tendons in Amputation of the Forearm at the Lower Third.*—Mr. HUGH CROSKERY communicated to the Surgical Society of Ireland (April 13, 1861) the following interesting observations on this subject.

The thousand dangers that have, in times past, been mentioned as being likely to occur after flap amputations at the lower third of the forearm, still continue to influence many surgeons of eminence to discard this operation altogether; and many limbs are now removed near the elbow, where a useful member might have been saved. This subject is still, unhappily, a matter of controversy, and the probability of the occurrence of the untoward results which actuated Larrey and others to prefer the removal of the limb at the upper third, is still found to be a stumbling-block to conservative surgery, and to influence many of the surgeons of our public institutions to sacrifice large portions of healthy tissue.

I communicated, in the beginning of 1859, a short paper on this subject to the Surgical Society, in which I described "a case of amputation of the right forearm at the lower third, in which the tendons were drawn down and divided an inch above their termination in the flaps;" and I brought forward that case, in the hope that the great success which followed the plan adopted would induce others to make further trial of it, and to communicate the results of their experience of it to the profession. I performed this operation, for the first time, in October, 1858, and a short time after I had communicated it to the Surgical Society, Mr. Alford, surgeon to the Taunton and Somerset Hospital, operated in a similar way, and published the results in the *Medical Times and Gazette* of Feb. 4th, 1860. In both these cases a useful limb was preserved, and the stump healed in a very short space of time. The subject of my case has been my own servant for the past three years, and he can use his handless forearm with wonderful facility.

I have lately had further opportunity for testing the value of this mode of amputation, and I have now no hesitation in strongly recommending its general adoption. It is easily performed. Two flaps are made after the process of Vermale—the palmer by transfixion, and the dorsal by cutting in a semicircular course from the tegumentary surface, the flap being then dissected back. After the limb has been separated in the usual way and the arteries have been tied, the soft parts are drawn well back by an assistant, when the tendons will protrude. Each tendon is then grasped with the rasped blades of a spring-forceps, drawn out, and cut off on a level with the flap. The flaps, which should be two inches in length, of equal size, and with broad angles, are then brought together with sutures and adhesive straps, and a roller is carefully and evenly applied with the view to the obliteration of the cavities left by the retraction of the tendons. The bandage should be brought up as far as the edges of the flaps, and the face of the stump should not be covered by it, but merely dressed with wetted lint. The flaps will be found to adapt themselves accurately together; and to furnish all that is requisite for immediate union. The stump will be healed completely within three weeks, and the bones will be protected by a firm cellulo-integumentary cushion.

The advantages of this operation are very great, and I do hope that other surgeons will give it a trial, and that it will be found to be as successful in their hands as it has been in mine. I have been, I believe, the first to bring it to the notice of the profession, if I have not been the first to practice it; and in bringing it to the notice of such a learned body as the Surgical Society of Ireland, my object is to have its merits, or demerits, discussed by a competent tribunal. I have found it to succeed in my own practice, and I am confident of its success in other and more skilful hands than mine.—*Dublin Medical Press*, May 1st, 1861.

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24. *Extirpation of the Shaft of the Tibia. Complete Recovery.*—The subject of this operation was a young man who had been affected with necrosis of the tibia for two years, and whose leg was, consequently, in such a disorganized condition that some of the most eminent Parisian surgeons, amongst whom it will suffice to mention M. Velpeau, had pronounced amputation at the thigh to be necessary. The performance of sub-periosteal extirpation of the substance of the tibia saved this patient, however, from the alternative of an operation which, according to French statistics, results in death in sixty per cent. of the cases in which it is resorted to, and has restored the limb to almost its original integrity of form, flexibility, and strength.

The portion of bone removed by M. Maisonneuve, under whose care the patient had been placed, was more than twelve inches long, an inch and a half in diameter at its upper end, and an inch at its lower extremity. Its surfaces were smooth and compact inferiorly, roughened and hollowed out superiorly.

The sequelæ of this operation were remarkable for their simplicity. The traumatic fever was of a very moderate character; the suppuration, which had previously been abundant and fetid, was replaced by a free discharge of a healthy character; and after the fortieth day the patient was able to get up and walk about with the aid of crutches, in the same manner as if a simple fracture only had been under treatment. The bone was very completely reproduced, and when M. Maisonneuve reported upon this case at the meeting of the Academy of Sciences, on the 18th of March, the young man had become strong and vigorous, the limb, which was formerly the seat of disease, not differing in any way from the other.

The value of the preservation of the periosteum with a view to saving the limb by thus promoting the formation of new bone has recently engrossed much professional attention in France. The Academy of Sciences have offered a prize of £200 for the best essay upon this subject, to be sent in early in 1862, and the Emperor, having learnt the importance which would attach to a proper solution of this question, has expressed his intention to double the prize.—*Lond. Med. Rev.*, May, 1861.

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25. *On the Growth of Long Bones and of Stumps.*—Dr. HUMPHREY read some interesting observations on these subjects before the Royal Medical and Chirurgical Society, April 12, 1861. In the first part of his paper he gave the results of some experiments with madder upon the bones of pigs with reference to the mode of growth of the bones in length. They were confirmatory of the observations by Hales, Duhamel, Hunter, and others, that the elongation is effected by addition at the ends of the shafts, the addition being effected by growth and ossification of the epiphysial strata of cartilage on the side next to the shaft. The experiments further showed that the growth at the two ends of the shaft is unequal; that it is usually most rapid at the larger end of the bone; and that it is always most rapid at the end where the epiphysial cartilage remains latest—that is to say, the growth proceeds most rapidly at the end where it is longest continued. The proper relation of the soft parts to the bone during the periods of growth is maintained by the interstitial growth of the periosteum, and by the continual sliding or shifting of that membrane upon the bone towards the end at which the growth is most rapid. This is attended with a certain traction upon the medullary and other vessels, and determines the direction of the canal for the medullary artery, which is always slanted towards that epiphysis which is last ossified to the shaft; in other words, towards that epiphysial line in which growth proceeds most quickly. The amount of growth in the respective epiphysial lines is very determined, and corresponds exactly on the two sides of the body, though that on the one side is not affected by the other; and it appers to regulate the amount of growth of the soft parts; for, if it be either arrested or accelerated, the growth of the soft parts is affected in a similar manner. In the second part of the paper the author showed the common impression, that a stump keeps pace with the rest of the body in its growth, to be erroneous. He did this by measurements taken from persons who had undergone amputation in childhood, and by experiments upon animals. The rate of growth varies. The stump rarely maintains its relation to the corresponding segment of the other limb; and it fails to do so, as might be expected, most markedly in those parts in which the growth of the bone takes place chiefly at the lower end. Thus, if amputation in the thigh be performed on a young child, one-third from the lower end, the stump, when full growth has been attained, will not be more than a third as long as the other thigh; its relative length will have thus been altered from two-thirds to one-third—that is, it will not have grown more than half as fast as the other thigh. The information derived from the measurements of stumps was thus shown to be quite corroborative of the observations made, in the first part of the paper, respecting the growth of the bones at their epiphysial lines. The instances in which the bone of a stump elongates so as to be troublesome and require a portion to be removed, are regarded by the author as quite exceptional, the phenomenon being probably due to some irritation, and being, therefore, of the same nature as the spicules and exostoses which are occasionally found upon stumps and on other parts of the skeleton.—*Med. Times and Gazette*, April 20th, 1861.

26. *Mode of Union of Fractures.*—Mr. Lawson exhibited (April 8th, 1861), to the Medical Society of London, two specimens illustrative of this, in which, under opposite circumstances, two distinctly different processes had taken place.

The first was that of the femur of an infant, nine months old, which had been broken, and in which the repair had been accomplished through the medium of a circumferential callus. The fracture had not been discovered until some weeks after the accident, consequently the extremities of the bones had not been kept in a state of perfect rest, and reparation had been effected in a manner similar to that which takes place in the repair of fractures of the long bones of animals.

The second specimen was the lower end of the femur, taken from a man who had met with a compound and comminuted fracture of that bone at the junction of its middle and lower third, and in which a vertical split, passing into the joint, had completely separated the two condyles. The man had progressed at first satisfactorily; but acute necrosis of the upper extremity of the femur obliged him (Mr. Lawson) to amputate the thigh, in its upper third, three months after the injury. The patient is now convalescent. In this preparation the two condyles, which had been entirely separated by a vertical split, had united; and from having been maintained in a state of perfect rest, and in direct apposition, the union had been effected without the intervention of any callus.

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27. *Removal of a Ball by means of the Trephine Twenty-two Months after its Penetration into the Cranium.* By M. Jobert.—J. G., aged 21, was admitted into the Hôtel-Dieu, Feb. 10th, 1857. Forming one of a force posted in front of the Malakoff tower, 8th April, 1855, he was struck by a ball in the forehead, the projectile, prior to penetrating the cranium, having come in contact with the external surface of the vizor, leaving a semilunar depression as it passed over the external edge of this. The man immediately fell from the parapet into the trench, a depth of seven feet, and remained unconscious in the ambulance for twenty-four hours. At the end of a week he was sent to the military hospital at Constantinople, where he stayed during four months. He then requested permission to return to the Crimea, and did so, in spite of the suppuration, which had never ceased. He fought at Traktir, 16th August, 1855, and returning to Paris in December, he remained for six months longer in the regiment. He was, however, unfitted for active service, being obliged to pass a considerable time in hospital. The symptoms continued much the same from the first, and consisted in a sensation of heaviness of the head, an uncertainty in the attitudes, and a feeling, when stooping, as if the forehead were separating from the head, suppuration always persisting.

On his admission into the Hôtel Dieu, a clean, circular aperture, about the size of a franc, was observed in the centre of the forehead. Passing the finger around the circumference of the opening, "osseous granulations, partial ossifications formed by the periosteum," could be felt, and on the introduction of a probe to the bottom, a hard, resisting, metallic body was recognized. After a crucial incision had been made and the aperture caused by the ball was found not to be sufficiently large to admit of its extraction, a circle of bone was removed by means of the trephine. The ball was now extracted, and some indurated, blackish blood was removed. The movements of elevation and depression of the dura mater, isochronous with the pulse, were plainly perceptible. The projectile proved to be a leaden ball weighing twenty-five grammes (375 grains.) Its surface was smooth and spherical over only a small portion of its extent, the remainder being rough and irregular. The details of the recovery need not be pursued, it sufficing to say that this was complete, the man as late as October, 1860, having been seen perfectly well.

M. Jobert calls attention to the fact of the ball having remained for so long a period in contact with the dura mater without inducing any inflammatory action. He also lays stress upon the circumstance of his having, after the completion of the operation, introduced the flaps formed by the crucial incision into the accidental opening. To this he attributes the non-occurrence of necrosis or osseous exfoliation usually observed after trephine operations when the parts are exposed to the air. Here, such exposure was prevented, immediate union of the raw flaps with the bleeding osseous surface being secured. The isochronous pulsations continued for a time visible, but they became more and more obscure as the tissues covering the aperture augmented in thickness.—*Brit. & For. Med.-Chir. Rev.*, Ap. 1861, from *Comptes Rendus*, 1861, No. 6.

28. *Gunshot Wounds produced during the Loading of Artillery.*—Dr. CORTESE relates five cases of gunshot wounds received by artillerymen while engaged in loading their guns, and gives the following summary of his observation: 1. No other blow of a projectile imparts like the present so great an amount of commotion to the entire limb. The state of muscular contraction prevailing at the time constitutes a kind of solidarity between the hand, forearm, and arm, which is the chief and necessary cause of this commotion. 2. This circumstance compels the surgeon to direct his attention to the entire limb, whatever amount of lesion may be manifest in the hand. A neglect of this precept may lead to gangrene gaining possession of a large portion of the limb, or to a generalized suppuration, while a diminished power of reaction in the injured parts may give rise to purulent infection, or render useless recourse to amputation. 3. In all those cases in which the hand is severely torn, its disarticulation, or even the amputation of the forearm, is insufficient to secure recovery. The surgeon's knife penetrates into infiltrated tissues, more or less destroyed in their intimate structure in consequence of the concussion they have been subjected to. So that independently of the fracture of the bone, and of the possible disjunction of the articulations of the ulna, the success of the reparative process would be very problematical. In such cases the arm should be amputated. 4. The sooner amputation is performed, the greater is the probability of a favourable result. 5. The rapid and very extensive tumefaction of the limb constitutes a sufficiently certain criterion of the severity of the derangements which are propagated along its whole extent. When fractures are not detected in the diaphysis of the bone, some lesion of contiguity or continuity in the ulnar articulation must be suspected. 6. When the lesion does not seem severe enough to call at once for amputation, we must always be prepared for secondary occurrences which will unfit the limb for its functions. (In two of the author's cases, paralysis of the limb remained.) Still, conservative treatment in such cases should be attempted.—*Brit. & For. Med.-Chirurg. Rev.*, April, 1861, from *Omodei Annali Univ. di Med.*, vol. clxxiv.

29. *Traumatic Tetanus.*—Mr. J. HUTCHINSON and Dr. J. H. JACKSON have given (*Med. Times and Gaz.*, April 6, 1861) a tabular statement of 22 cases of recovery from traumatic tetanus. The following are their conclusions as to the management of this disease.

1. The chief objects in view are three—to mitigate the force of the local irritation to which the disease is due; to sustain the patient's strength by food; and, lastly, by procuring sleep, to allow the nervous system the opportunity of regaining its wasted powers.

2. If the case be seen in the very onset, and if the injured part be a finger or toe, it is desirable at once to amputate, whatever may be the local condition. If the injury has been severe, and the part have passed into a state in which, whether from sloughing or otherwise, its recovery is doubtful, it is desirable to amputate at any stage of the disease, or even if one of the extremities be the part involved.

3. The injured part should be poulticed, and the limb above it wrapped in lint soaked in laudanum or chloroform.

4. The patient should be put in a room with but one attendant, and the strictest quietude should be insisted on.

5. If the patient has been accustomed to it, he should be allowed to smoke.

6. The bowels should be well cleared out by croton oil or other efficient purgative.

7. If the skin be very hot, the pulse jerking, and the tongue red and dryish, the surgeon may be justified in combining small doses of calomel with the narcotic he may have selected for employment.

8. A free allowance of beef-tea, milk, eggs, and similar articles of concentrated

fluid nutriment should be given, more especially in the later stages of the complaint.

9. As long as the patient is able to take food and to obtain periods of comparative quiet and freedom from pain, the use of anæsthetic inhalations is not desirable. Great advantages may, however, be obtained from them if he be unable to open the jaw sufficiently to permit of taking food, or if the tetanic spasms are without remission. Ether appears to have stronger facts in its recommendation than chloroform.

10. One or other form of narcotic—opium, Indian hemp, belladonna, or woorara—should be freely used. There is no very decisive evidence as to the advantage of any one of these over the others. Respecting the Indian hemp and the woorara, the difficulty often encountered in obtaining them in a state of reliable activity will often be an obstacle to their employment.

11. Excepting possibly in the per-acute cases the free use of quinine appears to be desirable. If given in large doses it generally reduces the frequency of the pulse, and in some cases a mitigation of the tendency to spasm has attended its influence. The rapid induction of cinchonism is a measure well worthy of a fair trial.

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30. *Radical Cure of Reducible Hernia.*—Professor SYME exhibited a patient to the Medico-Chirurgical Society of Edinburgh who had suffered from reducible inguinal hernia, and on whom he had lately operated by a method which accomplished the object aimed at by Wützer's operation, by a simpler mode, and one which he believed to be more effectual.

By the method recommended by Prof. S., "instead of a complicated apparatus for filling up the inguinal canal, the surgeon only required an elongated body of some kind, such as a piece of bougie, a piece of an œsophagus tube, a bit of wood, or even part of a wax or tallow candle; all the preparation required was, that a hole should be drilled through one end of the body chosen. The remaining apparatus consisted of a piece of strong thread and a needle, such as is used in sewing up dead bodies. The mode of application was as follows: The string was passed through the hole in the end of the body; the needle was threaded with one end of the string, and laid with its concavity resting on the forefinger of the left hand, which was then passed up along the cord within the external ring; the needle was then turned round, so as to bring its point upwards, and passed, with an inclination to the left, through the textures, and brought out on the surface of the abdomen; the other end of the thread was then passed through the parietes in the same way, only that this time the inclination of the needle was to the right; the two threads were then pulled tight enough to draw the body up the canal, and up it must go. The piece of tube, as in Mr. Wützer's operation, was smeared with cantharides ointment, to irritate the skin and favour the formation of adhesions. The two ends of the thread were then tied together; and, to prevent any chance of cutting through the skin too fast, a bit of elastic bougie was placed below them. For three or four days, or a week, a compress was placed over the groin, and retained in position by a bandage; and this was the whole process."

Prof. S. stated that he had repeatedly operated by this method, and in no case with any bad effect.—*Edinburgh Med. Journ.*, April, 1861.

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31. *Abdominal or Pelvic Abscess.*—F. C. SKEY, Esq., makes some interesting remarks on this disease (*Lancet*, April 27th, 1861). "These abscesses," he observes, "commonly present themselves in persons of impaired constitutions, reduced whether by accidental illness, by low living, or by any other debilitating cause. So far as I have seen and observed them, and I have attended many, their formation is always the result of one of these, or similar causes. There is, however, in this circumstance nothing very strange or remarkable, because, probably, all abscesses on a large scale are the product of low, and not of an exalted vitality.

"The general situation of that variety which forms the subject of my present remarks is the iliac fossa. It may, therefore, be termed either 'abdominal' or 'pelvic;' for although it occupies the iliac fossa, it is placed within the general walls of the abdomen. It appears in the form of a firm, not necessarily a hard, swelling, very distinctly perceptible on pressure over the above region. If small its presence is only readily detectable by comparison with the opposite fossa, into which the ends of the fingers sink on moderate pressure. In this respect, however, there is a difference appertaining to the varieties in the form and quantity of the contents contained within the abdominal walls, especially of fat, and the greater or less laxity of the walls themselves. Occurring in young women shortly after parturition, its presence is remarkably distinct. When large, the swelling is apparent to the eye as well as the touch, and it extends across the abdomen towards the mesial line, and upwards in the direction of the umbilicus. In such cases the swelling is prominent, and as it increases in magnitude, it encroaches on the intestines, which are pushed across to the opposite side. In many cases pain is not a prominent feature, and when present, it is usually not severe, but is dull and aching rather than acute in character.

"In its early stage I have known this form of disease to be mistaken for two other varieties of swelling—malignant disease of the pelvis, and scybalæ in the colon. From malignant disease it may be distinguished by the general uniformity of the swelling, and by the less serious constitutional signs of health undermined; and judging from liabilities, malignant growths of or from the pelvis are far more uncommon than chronic abscesses. These examples of pelvic abscess have presented themselves to my observation more commonly on the right than on the left side. I am not aware whether scybalæ collect more usually on that than on the left; but certainly they are more palpable and more readily detectable in the head of the colon than in the descending part of the intestine, which is placed in less proximity to the abdominal walls than that on the right side. But scybalæ are limited in their relation to the front abdominal walls by the caput coli, and moreover are movable, whereas the mass, which gradually resolves itself into the abscess, presents to the hand the sensation of a large and solid deposit, firmly fixed, and considerably larger than the intestine itself. The disease progresses very slowly, and often requires weeks for its development. As a general rule, it becomes soft, or, in other words, is converted into an abscess, which occupies its original site; in other cases the sac yields, and the matter extends in one or more directions, of which the most common is downwards along the track of the femoral vessels. I have seen three examples in which the matter made its way backwards through the sacro-ischiatic foramen, presenting the dimensions of a formidable abscess on the buttock, the upper part of the thigh, or over the region of the trochanter major. Occasionally the matter will extend across the abdomen behind the peritoneum, and take the course of the vessels of the opposite side, where it may point through the abdominal muscles above Poupart's ligament. In the case of a lady to which my attention was recently called, a large collection of matter formed underneath the integuments of the right iliac region. The abscess had been preceded by a large mass occupying the fossa beneath it for the period of many weeks. After having evacuated the sac, I detected an opening through the aponeurosis of the external oblique muscle sufficiently large to admit the end of the forefinger, through which the matter had escaped from the abscess below. The outer cyst contained about a pint of brownish pus, both in colour and consistence very unlike the fluid contained in a psoas abscess.

"Two remarkable examples of this disease have been under my treatment in St. Bartholomew's Hospital within the last few months. The first was that of a boy about fifteen years of age, who fell down on the ice in January last, and struck his left trochanter severely. Considerable pain followed the injury, which was deemed rheumatic; and he was admitted into the above hospital and placed in a medical ward. While there, a swelling formed over the *right* iliac fossa, for which he was removed into a surgical ward, and came under my care. He had an abscess pointing both above and below Poupart's ligament. The upper projection was very prominent, and threatening shortly to burst its way through the skin; but I preferred to evacuate the abscess through the lower opening. About six or eight ounces of matter escaped. For some days he appeared much relieved by the operation; but he gradually lost his appetite, became hectic, and died in three weeks. On examination, it was discovered that the fall had occasioned a rupture of the fibrous capsule of the left hip-joint, and fracture of the acetabulum. Matter had formed in this region, which had extended across the abdomen behind the peritoneum to the right side, and made its way through the abdominal parietes where I had punctured it. During life the boy did not complain of any pain or even discomfort on the left side; and what is worthy of remark is, that during the last week of his life he lay over entirely on his left hip.

"When these pelvic abscesses are large and their progress towards maturity is unusually slow, when they are placed deeply within the pelvis and the matter is bound down by the pelvic fascia, they seldom fail to involve contiguous bone; in which case they generally prove fatal. I opened a large abscess occupying the left iliac fossa of a lady thirty years of age. I had watched the progress of the disease for many weeks. She died, and on examination the matter was found to have involved the entire surface of the venter ilii.

"The indication to which the treatment in such cases clearly points is that which will most readily convert a chronic into an acute abscess. Any attempt to 'resolve' or 'discuss' these morbid deposits would be futile, and quite unworthy the advanced progress of scientific surgery. To what end would mercurial ointment and iodine and similar agents point? What is their power? Do they possess any? And if they do, could mercurial inunctions induce the circulating system to reverse its action by taking up the morbid deposit it had previously got rid of? In large chronic abscess, whether in the primary thickening or the confirmed stage of fluidity, every function of the body is stamped with indications of debility. Can we hope to infuse healthy actions and promote vital power in a part while the whole remainder continues weak? The condition is that of weakness. Why matter or lymph was deposited in this or that locality it may not be easy to solve, but we can readily conceive that if not deposited there the morbid condition would present itself elsewhere in the system. In order to obtain absorption of the deposited mass without passing into suppuration we must convert the present stage of debility into the highest condition of vigorous health, and that is impossible. All that we can hope for, all that the best resources of art can achieve, is to change the chronic into an acute abscess, to advance the formation of pus, and to compel the abscess to select that locality through which it can most readily discharge its contents on a surface of the body. To effect this the appetite must be improved, and gratified with as large a quantity of nutritious food as can be digested; force and vigour must be given to the pulse by means of stimulants—and the capacity for stimulants in these cases of debility is very great—while the lungs should be supplied with an ample quantity of fresh air for the thorough oxygenation of the blood.

"If there be one therapeutic agent more valuable than another in promoting suppurative action, it is bark, and it should be given throughout the treatment in full quantities. At the earliest moment at which fluid can be detected near the surface the abscess should be freely opened. It most commonly points through the abdominal muscles, but the rule equally applies should the abscess point towards the rectum, or, when occurring in the female, towards the vagina, or on the nates or region of the trochanter."

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32. *Pulsating Bronchocele.*—Dr. J. Bullar read before the Royal Medical and Chirurgical Society (Feb. 26, 1861) an account of two cases of bronchocele, in which the distinctive complication was the violent pulsation of the carotid arteries and of the enlarged thyroid arteries, communicating the pulsation and thrill to every part of the enlarged lobes. In one of these (a male), the pulsation and bruit were so communicated to the lobes, the enlargement of which was of small size, that the case had been suspected to be carotid aneurism, and it required careful examination to be certain of its exact nature. It was brought on by pressure, round the neck, of tight shirt-collars, the patient being in a state of great debility. Under a tonic regimen, with quinine, iron, iodide of potassium, in small doses internally, and iodine externally, the pulsation gradually ceased, so that twelve months afterwards the only vestige was a small hardness of one lobe. In the second case (a female), the bronchocele was much larger,

the pulsation even more pronounced, and with great distension of the veins of the neck. This was combined with disease of the heart, ascites, and anasarca of the legs. Under diuretics (including digitalis and iodide of potassium) and iron, the dropsical symptoms were removed, and at the same time the pulsation and venous distension ceased, and she was restored in five months to comparative health. Iodine externally somewhat diminished the bronchocele. Sir Benjamin Brodie, who saw the first case, in a letter given, states that he has only seen one other. In both cases, that undue prominence of the eyeballs which often attends bronchocele in the anæmic, was well-marked, and remained, though diminished.

Dr. EDWARD SMITH was not aware that the cases were so rare as the author supposed. He had seen one case. The subject of it was a lady, aged 20. It was well-marked, and the bronchocele pulsated strongly, and varied both in size and in degree of pulsation at different times. There was in this case, also, disturbance of the uterine functions.—*Med. Times and Gaz.*, March 9, 1861.

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33. *Communication of Secondary Syphilis.*—The following case, communicated to the *British Medical Journal* (March 23, 1861), illustrates some interesting points concerning the transmission of secondary syphilis. It shows, in particular, that a chancre once healed may, nevertheless, during the progress of the constitutional disease, yield a secretion which (although not capable of being again inoculated upon the same patient) may infect others, and produce in them a disease having all the characters of the primary indurated chancre:—

"Two years ago a lady consulted me for what she described as a complete break-up in her health, and as I had known her before, the change in her appearance was certainly very remarkable. She had been a widow, but had married some months before a gentleman much younger than herself, and, after some questioning, I discovered, at last, something that excited my suspicions. On making an examination, I found inside the labia two indurated chancres immediately behind the fourchette. They were too well-marked to allow the slightest doubt to exist about their nature; and, on inquiry, I found she had first noticed them about six or seven weeks before; one of the glands in the groin was likewise materially enlarged. Before putting her under treatment, I saw her husband, and he at once informed me that nearly *a year before* his marriage he had contracted a sore, had been treated by an apothecary, and had been pronounced *quite well*. He had never any eruption on his skin, but had since laboured under ulcerated sore-throat and pains in his joints, which he attributed to rheumatism. I examined his penis, and between the prepuce and the glands on one side of the mesial line was the remains of a large ulcer, hard and irregular; but apparently quite healed, though I thought I could detect a slight watery exudation from its surface. Perfectly satisfied now in my own mind as to the nature of the affection his wife was labouring under, I put her at once under the influence of mercury, and with the usual local treatment the sores on the genitals healed, and the tumour in the groin disappeared. Some months afterwards, however, her chest and back were covered with a copper-coloured eruption; the glands in her neck likewise became engaged, and a deep ulcer appeared on one of her tonsils. Under suitable treatment, she has perfectly recovered, and her health has continued good up to the present time. Her husband, who, I think, was not at first thoroughly satisfied as to the fact that he was the cause of his wife's illness, was shortly afterwards made painfully aware of its truth. He was attacked with syphilitic laryngitis, and his life was saved almost by a miracle. A large venereal bubo likewise formed in his groin, involving a degree of suffering that was absolutely pitiable."

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34. *On Affection of the Mucous Follicles of the Urethra in Gonorrhœa.* By M. DIDAY.—If we examine closely the orifice of the urethra in a subject of gonorrhœa, we may sometimes discover in its vicinity a narrow aperture, through which may be made to issue, by pressing the glans forward, a droplet of discharge. Passing a needle into this aperture, it penetrates to a depth of from three to six millimetres in a direction parallel with the urethra. The orifice of this aperture resembles that of the urethra in being red, tumefied, pale, or indo-

lent, accordingly as the gonorrhœa is in its acute or chronic stage; and when the patient has gonorrhœa several times, this lesion will be found always reproduced. The lesion consists in the gonorrhœal condition of one of the mucous follicles of the urethra, and constitutes a highly troublesome complication of the ordinary urethral affection, as respects the curability of this latter and the prolongation of contagiosity. The contagious pus which issues from the follicle is small in quantity and intermittent in appearance, and the lesion may be easily overlooked. Unaffected by injections and balsamiferous urine which do not come in contact with it, this lesion may persist long after that of the urethra has been cured, and as long as it does persist, infection continues. After trying various means for its cure, M. Diday has come to the conclusion that the only one which is feasible is the obliteration of the abnormal cavity by means of the actual cautery. He at first effected this by introducing a small heated needle into the orifice, and carrying it to the end of the passage; but as the doing this is somewhat tedious, the needle had time to cool before reaching its destination. The plan he has finally arrived at, and the one which he recommends as quite successful, is to pass a small knitting-needle to the very bottom of the duct, and shielding the glans by means of a paper covering, to heat the needle by placing a candle under it until the orifice is whitened, and a grizzling sound is heard. This amount of cauterization suffices for the cure, and when performed thus slowly, is easily effected. All acute inflammatory action must have subsided before it is put into force.

M. Diday takes occasion to observe, that in gonorrhœa the inflammation does not occupy the surface of the canal, but is engaged with a number of follicles similar to the one mentioned above, and that our object in its treatment should be to retain medicinal agents in the urethra as long as possible, so that they may penetrate into these little recesses. This may be done, in the case of urine charged with copaiba or cubebs, by means of a forceps contrived by M. Diday, the urine being thus kept for several hours in contact with the parts. When injections are employed, too, pressure should be made by the fingers at the entrance of the urethra and behind the scrotum, the fluid thus, imprisoned being then forced to and fro.—*Brit. & For. Med.-Chirurg. Rev.*, April, 1861, from *Gazette Hebdomadaire*, 1860, No. 45.

OPHTHALMOLOGY.

35. *Impairments of Vision caused by Lactation.*—Mr. Geo. Lawson has published (*London Med. Rev.*, May, 1861) some interesting remarks on the impairments of vision so common in feeble women, or those labouring under exhaustion, during the period of lactation. Mr. L. points out two distinct forms of the disease. "In the one the eye is directly affected, and there is sufficient manifestation of morbid action to account for all the impairment of vision of which the patient complains. In the other the defect appears to be central or cerebral. The appearance of the eye is normal, or the conjunctiva may look, perhaps, more pale or blue than usual, corresponding with the anæmic condition of the patient, or sometimes it may be even a little injected, but there is nothing to be seen either externally or with the ophthalmoscope to account for the deficiency of sight from which she suffers.

"In the first form the symptoms are as follows: The patient complains of her eye being bloodshot; a feeling of giddiness; and of some slight intolerance of light. There is an inability to read long, as the lines become misty and the words run together; the eye looks inflamed, irritable, and watery, presenting very much the appearance of one from which a foreign body, as a bit of dust, or a spicula of iron, had been lately removed. It has a generally pink appearance, and the ciliary veins are rather large, showing internal congestion. If the case be a severe one, the redness increases, as does also the impairment of vision, until she is able scarcely to read large cannon type; the pupils are sluggish and rather contracted; her pulse quick and small; and her appearance that of exhaustion, accompanied with some febrile symptoms. Her sleep is disturbed; and on rising in the morning she has a feeling of giddiness and lassitude as if she had never been to bed. The appetite is bad.

"The case is one of choroidal congestion, and this congestion is passive. It is dependent on anæmia, and on an exhausted condition of the nervous system produced by suckling. The delicate vessels of the choroid, furnished as they are with filaments from the sympathetic nerve, are capable in health of maintaining their proper calibre during the circulation of the blood in them; but when the patient has become exhausted by long suckling, and exhausted to an extent which no other cause seems capable of producing, these vessels seem to lose the control of their sympathetic filaments, and to yield before the impulse of the blood, and thus become distended. Choroidal congestion is produced, and its effects are soon realized. That this congestion is the result of a deficient sympathetic nervous supply is clear from the experience of Brown-Séquard, who divided in a rabbit the sympathetic nerve in the neck, and immediately produced a turgescence of all the parts above the seat of the division, the side of the head and face in which the division was effected becoming visibly congested, and its temperature sensibly increased.

"If the case be now properly treated there is every probability of the eye being soon restored to its normal state; but if the patient continues to nurse and to neglect all those remedies which are placed at her disposal the disease progresses, the iris becomes involved, and a low form of choroido-iritis or choroido-retinitis is the result. Plastic effusions may now take place, and permanent mischief may follow, such as adhesions between the iris and lens, or effusion between the choroid and retina."

In the second form, there is "in the early stage, nothing whatever to be seen on looking at the eye superficially, beyond the pallor of the conjunctiva, which, however, corresponds with the anæmic look of the patient. Frequently there is a little conjunctivitis, associated with a red condition of the edges of the lids and caruncle, appearances which are characteristic of want of power. It is this impairment of vision which is most generally seen in its slightest forms, and for which the surgeon is so frequently consulted. Giddiness and lassitude on rising in the morning, and a failing of the appetite, with general muscular debility, are the early symptoms which indicate that the drain produced by lactation is greater than the patient makes up for by the nourishment she takes.

"Reading is difficult, and is attended with an effort, but the words soon become confused, and the lines run together, and the book or paper is obliged to be thrown away.

"Similar symptoms are described by the poorer classes in reference to their work; they lose the stitches, and cannot see where they last entered the needle.

"These symptoms are so common, that they must have been observed by all, and frequently an improved diet, with tonics and other means which are used for the improvement of the health, may enable the patient to continue nursing her child, and at the same time to afford relief to the symptoms she is suffering from. The condition of sight of the patient at this period, may be described as that of asthenopia. Debilitated by an exhausting cause, her nervous energy is enfeebled, and the general muscular debility which exists in such cases is strikingly shown in the want of power which prevents the patient maintaining the action of the ciliary muscle for accommodating the eye to near objects, and thus converging the rays to a focus on the retina. On first opening a book, the patient for a time is able to read, but the ciliary muscle soon becomes exhausted, and relaxing itself, the image is immediately either entirely or partially thrown out of focus, and becomes either indistinct or else completely lost.

"The eye, examined with the ophthalmoscope, is normal, or, perhaps, the fundus may be more pallid than is usual, but there is nothing seen to account for the great impairment of vision which exists. It is to some central change that we must attribute the want of the due appreciation of the images which are formed on the retina. The cornea and all the humours of the eye are clear, and light is freely admitted within the globe, and yet the patient fails to see. It may be that the brain is deprived of some of the elements essential to its proper nutrition by the drain which excessive lactation produces in the mother, and that for the want of a better term we must attribute it to an exhausted nervous energy.

"But if this affection advances, further changes undoubtedly take place, and in addition to the patient losing, to a great extent, the power of focusing the eye for more than a short time for near objects, or requiring continually to re-adjust itself, the retina becomes somewhat insensible to the images which are formed upon it, and from at first only appreciating large and dark objects, it gradually ceases to take cognizance of them at all, and a state of amaurosis is established. It is difficult to estimate the cause of this amaurotic state, or to ascertain what are the pathological changes which produce it. That this amaurotic condition is dependent on suckling is proved by the fact that it can be greatly relieved, and often cured, if properly treated; first, by weaning the child; and secondly by the free use of those tonics which seem to have a special action in invigorating and restoring tone to the nervous system.

"Some women can never for any length of time suckle their children, for after a few weeks, or months, the eyes become affected, and the impairment of vision increasing, they are compelled to cease.

"If, in spite of the continuance of the symptoms, the woman continues to nurse her child, the case may proceed from bad to worse, and what at first was only a functional disease, may ultimately become an organic one, from atrophy and waste of the parts from want of use, and the eye, which originally exhibited no abnormal appearance, may assume the peculiar condition of one which has long been deprived of its power of sight, and the large bluish-white optic disk, with the shrunken and thready retinal vessels and the patches of atrophied choroid, indicate that changes have taken place which give little hope for future recovery."

In the treatment of these cases, Mr. L. says: "The first and manifest course to be adopted is, if the case is a severe one, at once to remove the exciting cause, and to order the mother to wean the child. If the case is one of choroidal congestion, attended with some photophobia, the patient should be prevented exposing her eyes to strong light; the room in which she sits should be slightly darkened, and she should not be allowed to use her eyes, either in attempting to read or to do any needlework. She need not confine herself to the house, but, on the contrary, a moderate amount of out-door exercise will do good, but the eyes should be protected from any strong sunlight by wearing a pair of cobalt blue glasses, of any shade which she finds most comfortable. The frequent application of cold is often a source of relief, and this may be applied either by cold sponging, or else by a douche, using it with the lids gently closed, four or five times during the day. The bowels should be carefully regulated with pil. hyd. c. colocynth. or some other mild alterative. It is seldom that a mercurial course is required, indeed there is no indication for such a line of treatment, unless the congestion of the choroid has extended to the iris, and a chronic choroido-iritis has been established, in which case mercurials are undoubtedly called for, but quinine should at the same time be freely administered. In all cases quinine with iron seems to be the medicine which affords the greatest relief, or it may be given alone if the iron is not required. In some cases where there is a condition of great anæmia the mist. ferri comp. is a most valuable medicine.

"In the second class of cases, in which the eye itself evidences no internal congestion, but the impairment of vision appears to be cerebral, very much the same line of treatment is required. Weaning the child, absolute rest to the eye, good diet, and the free exhibition of steel and quinine are the remedies which afford the patient the greatest benefit, and which generally succeed in restoring perfect sight to the patient. The class of cases which seem to derive no benefit from treatment are those in which there has been a long impairment of vision, and suckling has still been continued; when, in spite of repeated warnings, the mother has still continued lactation; and when, as the result of such imprudence, some organic change has taken place either in the nervous apparatus of the eye itself, or in that part of the brain with which the eye is associated. That this change may be molecular, and to us at present inappreciable, is possible, but the fact of our not being able to understand what lesion exists, does not forbid the idea of one being present."

36. *Hypertrophy of the Connective Tissue of the Optic Nerve in Relation to Albuminuric Amaurosis.*—A case which is of much interest with respect to the occasional complication of amaurosis in albuminuria, has been recently communicated to the Medical Society of Sweden, by Professor MALMSTEN and Dr. GYLLENSCHJÖLD.

It was that of a man, sixty-six years of age, who had suffered for several years from albuminuria. After having suddenly lost the sight of the right eye this patient was affected in a similarly abrupt manner three days subsequently with very marked amblyopia in the left eye. Objects of a large size could alone be distinguished, and this condition, which was not accompanied by any lesion appreciable with the aid of the ophthalmoscope, continued until death.

Upon making a post-mortem examination the kidneys were found to be waxy and enlarged. The retinæ were not the seat of any of the morbid appearances which have been noticed by numerous observers in albuminuric amaurosis, but the two optic nerves were completely destroyed at the point of entrance through the sclerotic by a peculiar substance composed of connective and elastic tissue. This mass, in which the nervous filaments were found, as it were, smothered, commenced in the neurilemma, at the border of the sclerotic, and was continued, under the form of fibrous strings, between the nervous filaments.

Professor Malmsten stated that he had found this singular deposit in three persons who had become amaurotic at an advanced period of Bright's disease, and in whom the retinæ and other parts of the eye presented no abnormal appearance.

Apart from the ecchymosis and infiltrations into the retina occasionally noticed in albuminuric amaurosis, this injury to the optic nerve deserves the attention of the physician as one of the causes of that complication of Bright's disease, the relative importance of which remains to be determined.

In alluding to the observations of Professor Malmsten, the "*Gazette Hebdomadaire*" draws attention to the cases published last year by M. Graefe, in which the hypertrophy of the interstitial cellular tissue of the optic nerve, with sanguineous injection, was consecutive to intercranial tumours and to cerebritis.—*London Med. Rev.*, May, 1861.

MIDWIFERY.

37. *Treatment of Cases of Abortion in which the Membranes and Placenta are retained.*—Dr. W. O. PRIESTLEY read a very interesting paper on this subject, before the Obstetrical Society of London (May 1, 1861). The author began by observing that when abortion occurs in the early weeks, the ovum is frequently expelled without rupture of any of the membranes except the external decidua, because the attachments to the uterine cavity are unstable; the mass is then smaller and less difficult to push through the os uteri, and the contractile power of the uterus is very feeble. In the third, fourth, and fifth months the decidual cavity is obliterated, the placenta has acquired more intimate attachments to the womb, and the contractile power of the uterus being greater, rupture of the membranes commonly takes place before expulsion. The embryo having escaped, the secundines may speedily follow, or, lying in the os uteri, they may be removed by the finger or some simple instrument. In a considerable number of abortions, however, in which the fœtus and liquor amnii have been voided, the secundines are not soon extruded; and after the uterus has made repeated ineffectual attempts to expel them the os uteri closes and action ceases. Instances of this kind are common in obstetric practice, and are often a source of much embarrassment to the practitioner. Obstetric authorities differ widely as to the treatment which ought to be adopted when the secundines are

not thrown off spontaneously, and particularly as to the propriety of manual interference. Dr. Denman, Dr. Davis, Dr. Ramsbotham, and Dr. Dewees deprecate any attempts at extraction by the hand; and Mr. Ingleby held that "no manual extraction can be effected prior to the sixth month." Dr. Burns and Dr. Churchill regard interference in this way as only allowable in exceptional cases : and Dr. Tyler Smith stands almost alone in recommending the removal of the secundines in all cases of abortion where they are retained. The author regarded the question of treatment as an important one to all obstetric practitioners, as they might be blamed on the one hand for omitting a duty they ought to have performed, or on the other hand might be charged with meddlesome practice. He had met with a considerable number of patients who had seriously suffered from placental retention, and this had induced him to bring the subject before the society for the purpose of eliciting opinions as to the proper course which ought to be followed. The dangers and morbid conditions arising from membranous and placental retention were stated to be:—

1. Flooding; this being sometimes of a very serious character, and the patient being always liable to hemorrhage so long as the fragment remains.

2. Decomposition of the uterine contents, leading to local inflammation of the uterus and surrounding tissues, to phlebitis and phlegmasia dolens, and lastly to general poisoning of the system, as evidenced by irritative fever, peritonitis, rheumatic pains, the formation of abscesses, and even the occurrence of death.

3. Sub-involution of the uterus.

4. The generation of some of the forms of mole out of the tissue left in the uterine cavity, and the hemorrhage attending the presence and expulsion of these morbid growths.

The entire absorption of the placenta was regarded as uncertain and not to be counted upon. Cases illustrative of the several sources of danger were detailed.

In considering the various methods of treatment which have been recommended, the author's experience led him to believe that the effect of the administration of ergot was very uncertain, and that galvanism and injection of water were not to be depended upon. Any form of abortion-forceps which must needs be pushed beyond the reach of the finger he regarded as useless and dangerous. He was thus driven to the conclusion that the introduction of one or two fingers into the uterus was the safest and best way to remove the retained uterine contents. In his hands such manual interference had never been followed by any evil results, and a considerable number of cases had fallen under his observation. He begged particularly to be understood as not advocating rash and violent attempts to empty the uterus. Rough and careless manipulation might be fatal to a patient; but the consequences of placental retention were so serious that, under ordinary circumstances, less risk was incurred by the operation. It was important to effect removal, not only before putrescence began, but before the os uteri became much contracted; and if in six hours after the escape of the embryo the placenta did not follow, it might be removed. The extraction might be effected sooner than this if much hemorrhage were present. He had found it convenient in operations to place the patient on the back, with the thighs flexed on the abdomen; and while one hand steadied and depressed the uterus externally, the other was with all possible gentleness passed into the vagina. The os uteri was then dilated with the index-finger, and the second finger followed if required. These two fingers formed the best and most sensitive forceps, and although time and care might be necessary to their introduction, their employment was most satisfactory. The administration of chloroform previous to the manipulation afforded great assistance by relaxing the passages and saving the patient from pain. The author had succeeded in removing the placenta with the hand in some cases days and weeks after the escape of the fœtus; but he had never ventured on any such attempt if inflammatory symptoms and irritative fever had already set in. Where the os uteri was too contracted to permit the introduction of the finger for the removal of a placental mass, its dilatation could be effected by sponge tents, which had the double advantage of staying hemorrhage and facilitating the passage of the finger.

In the discussion to which the reading of this paper gave rise, Dr. TYLER

SMITH said that in rare cases, the placenta was no doubt absorbed after abortion. But the chance of such an occurrence ought not to be allowed, as it led to hemorrhage, and infection of the system by putrid matter. The number of instruments devised to extract the placenta showed how important the matter was in practice; but nothing yet produced was equal to the hand and finger. He had always taught that in abortions occurring even before the formation of the placenta, the thickened decidua should be removed, if it remained and caused excessive draining, after the passage of the embryo. In the early months, the uterus was only partially developed, so that its expulsive action was comparatively feeble, and the difficulty was often increased by adhesion of the decidua and after-birth from disease. In later abortions, he always removed the placenta as soon as its retention produced mischief. It was seldom necessary to pass more than one finger to detach and hook down the retained mass. In some cases, the whole hand required to be passed into the vagina; in others, the uterus was sufficiently low to admit of the passing of the finger without this. Chloroform was often of great value in promoting dilatation of the osteum vaginæ and os uteri, particularly in cases where the retention had lasted several weeks, or even months. He had not seen any mischief follow the removal, but the contrary. The conditions were that the hand should be clean, and the proceeding without violence. He might mention that in cases of flooding after delivery at the full term, when the placenta had been expelled, he had frequently passed the hand into the uterus to remove portions of membrane which were apt to separate from the placenta and remain in the uterus, or hang from the os. Many of the worst cases of flooding met with in practice were, he believed, of this kind, and to clear out the uterus was the only effectual way of stopping the loss of blood.—*Lancet*, May 11, 1861.

38. *On the Length and Weight of New-born Infants.*—Dr. E. von SIEBOLD, of Göttingen, has been accustomed to carefully weigh and measure all the new-born infants at the midwifery institutions with which he has been connected from the beginning of 1852, his chief object being to ascertain whether the statement is correct that new-born infants lose weight during the first days after birth, afterwards regaining and augmenting it. Not only may such investigations prove of importance in this obstetrical relation, but also as regards physiology and juridical medicine. Weighing children has been employed in these midwifery institutions to determine how far artificial feeding would be tolerated, whether an illness of the mother is acting injuriously on her child, and as one element in the choice of wet-nurses. Dr. E. von Siebold first presents a table of the weights of 3000 infants (1586 male and 1414 female), weighed immediately after birth. From this table (for which we have not space) it results that by far the greater number of the children (2215) weighed between 6 and 8 pounds.[1] From 5¾ to 6 lbs. the numbers rose from 99 to 268; and from 8 to 8¼ lbs., they fell from 226 to 67, and never rose again at any weight to 100. From 8¾ to 9¼ lbs. they sank from 61 to 8, rising, however, at 9½ lbs. to 21. Only 6 weighed 10 lbs., one 10¾ lbs., and two 11 lbs. The author has never but once met with a child weighing 11¾ lbs. The most frequent weight in the 3000 was 7 lbs., numbering 426. It is a remarkable fact, that until the weight of 7 lbs. the female infants exceeded the males in number, the latter thenceforward predominating. This agrees with Scanzoni's figures, who found that the weight of the male infants in 9000 births averaged 7 lbs. ʒij, or ʒiij; and of female infants, 6 lbs. ʒxxviij, the female infants weighing less than 7 lbs. more frequently than the males. From these statements and those of various other writers here quoted, the conclusion may be drawn that the normal weight of a mature new-born infant is not less than 6 nor more than 8 lbs., the average weight being 6½ or 7 lbs., the smaller number referring to female, the higher to male infants.

Chaussier and Quetelet have already shown that for the first few days after birth a diminution in the weight of the infant takes place, and since the beginning of 1859 the author has paid much attention to this subject, having carefully examined the weights of 49 children. In 35 of these diminution did take place,

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[1] The author does not specify it, but we believe he means the pound Troy.

16 of the number losing ¼ lb., 14, ½ lb., and 5, 1 lb. In these last instances, however, the nutritive process was manifestly defective, and the children did not rally again, so that they cannot be included in the statement. The normal diminution of weight was observable in the 30 children from the second to the third day after birth, the weight remaining then the same to the fourth, or even the sixth day. From the fifth to the seventh day, mother and child being well, the weight which existed at birth was again attained, and then increased. In 14 of the children examined neither decrease or increase of weight was observed until from the sixth to the eighth day, when increase commenced. The mean of Quetelet's observations is thus stated. The child weighed at birth 3126 kilogrammes; on the second day, 3057; on the third, 3017; on the fourth, 3035; on the fifth, 3039; on the sixth, 3035; and on the seventh day, 3060 kilogrammes. This diminution in weight in most of the children, and the arrest of its increase in others is evidently dependent upon the change in its mode of nutrition on arriving in the world. The character of the early milk is very different to that which it afterwards assumes, containing more colostrum corpuscles than milk-globules, and possessing rather a purgative than a nutritive action. Not only is the child's weight found to diminish, but its entire body gives signs of the defective nutrition, the redness of its surface being exchanged for one of a yellow, or at least a white colour, while there is also observable a certain relaxation of its limbs, signs which all disappear again in a few days. The author is sensible that his numbers are too small to enable him to arrive at any decisive conclusions, and he appeals to other obstetricians for their co-operation in the investigation.

A large proportion of the children were weighed daily after the eight days above alluded to, in order to ascertain their rate of increase. The statement of their increasing stationary or decreasing weight is given in detail from day to day, but for this we have not space. Suffice it to say, from a comparison of the whole, it results that the average normal increase within the first nine days may be set down at ¼ lb., and that within the first fourteen days at ½ lb. Beyond this age the number of children examined was not sufficient to justify any exact conclusions, although it seems most probable that the increase of 1 lb. weight is not attained, as a general rule, until the twenty-eighth day.

The length of new-born infants exhibits much less difference than does their weight. Of the 3000 children measured, the length varied from 15 to 21 inches; but out of the number no less than 1674 measured 18 inches, and 695, 17 inches, so that the mean length was between 17 and 18 inches. As in the case of the weights, so in the lengths, the females exhibited the lesser numbers. Thus, of 695 children which measured 17 inches, 380 were females and 315 males; while of the 1674 which measured 18 inches, 867 were males, and 807 females. Of 305 children, 19 inches long, 198 were males, and 107 females; and of the 49 which measured 20 inches, there were 37 males, and only 12 females. Elsasser and Quetelet observed similar results.—*Med. Times and Gaz.*, March 16, 1861, from *Monatsschrift für Geburtskunde*, vol. xv.

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39. *Placenta Prævia, Podalic Version.*—Dr. D. L. Roberts relates (*Edinburgh Med. Journ.*, Feb. 1861) three cases of placenta prævia in which he performed podalic version. These cases, he says, "are demonstrative of the fact that turning may be performed with safety to the mother when the os uteri is only dilated to the size of a shilling, provided only rigidity be absent; and that if we wait, as some obstetricians recommend, until it has attained the size of half-a-crown, the powers of the patient may in the meantime be so exhausted as to render recovery next to impossible.

"2d. That the administration of full and decided doses of laudanum with Indian hemp, is beneficial in preventing the syncope which so often occurs after severe hemorrhage.

"3d. That where the child is dead, and version has been performed, and in cases where the os uteri is not sufficiently dilated to permit of the head passing easily, I would prefer keeping up gentle traction, and trusting to the natural powers, rather than making forcible attempts at extraction, and running any risk of lacerating the cervix uteri; as by the former means the head is brought to press more continuously upon the open vessels, thus preventing any further hemorrhage."

40. *Placenta Prævia.*—GLISCZYNSKI states that, from the records of the Klinik at Breslau, it appears that in 10,540 cases placenta prævia occurred ninety times. Deficient involution of the uterus in women who have quickly succeeding pregnancies, or diseased conditions—such as uterine catarrh, inflammation after former labours, &c.—are, he believes, the chief causes of this condition, which is mostly present in multiparæ. In the 90 cases, 62 children lived, 28 died; 76 mothers lived, 14 died. In 9 cases, *accouchement forcé* was necessary; two of the mothers died.—*Ibid.*, from *Med. Centz. Ztg.*, 1858.

41. *On Serous Discharges during Pregnancy.* By M. DANYAU.—At the meeting of the Society of Surgery of Paris, held on the 19th of December, 1860, M. Danyau made some remarks on the above subject. It is sometimes noticed that, during the last weeks, or even during the last months of pregnancy, an intermittant serous discharge takes place, regarding the nature and origin of which there has been much difference of opinion. Naegalè thought that it could not be the amniotic fluid, but that it was secreted between the membranes of the ovum and the uterus; this opinion was generally received, until a fact observed by Ingleby, and cited by him in a memoir on uterine hemorrhages, again raised the question, and made it probable that it was the liquor amnii. In the centre of the membranes the perforation through which the fœtus had passed was found, and nearer the placenta was another orifice which had given exit to the fluid. M. Dubois then met with another case of the same nature, where the small opening was of old standing, and its margins had a cicatrized appearance.

Such was the position of the question as briefly stated by M. Danyau, who laid before the Society the membranes from a woman who was delivered on the 12th of December, in whom a serous discharge had existed for fifty-six days. The placenta was inserted near the neck of the uterus; on one side was to be seen a large perforation, that through which the infant had passed, while opposite to it was another small opening which had allowed the escape of the amniotic fluid. The discharge, said M. Danyau, may be intermittent, and more or less abundant, according as the fluid escapes more or less rapidly, or accumulates between the membranes and the wall of the uterus.—*Ed. Med. Journ.*, Feb. 1861, from *Gaz. Hebdom.*, 21 Dec. 1860.

42. *Ascites Complicating Pregnancy.*—Tapping an ascitic patient, who is also pregnant, generally tends to bring on premature labour. To prevent this, M. Pigeolet advises to puncture, with a fine trocar, the projection which is generally present at the umbilicus, and thus to allow the fluid to gradually drain away. He has employed this method with success in one case.—*Brit. Med. Journ.*, May 18, 1861, from *Rev. de Thérap.*, 1 April, 1861.

43. *Glycerine and Tannin in the Treatment of Vaginitis and Leucorrhœa.*—A Belgian physician, Prof. SOUPART, of Gand, has derived great benefit in the treatment of vaginitis from the local application of a solution of tannin in glycerine. The proportion recommended is one ounce of tannin dissolved in two ounces of glycerine. The walls of the vagina are to be painted over with this application; and a plug is introduced into the orifice, to prevent the glycerine from running out. Several very obstinate cases are recorded, which yielded at once to this treatment.—*British Med. Journ.*, April 6, 1861, from *Journ. de Méd. et de Chirurg.*, Feb. 1861.

AMERICAN INTELLIGENCE.

ORIGINAL COMMUNICATIONS.

Peritonitis from Perforation of the Appendix Vermiformis, resulting in Gangrene. By Frederic D. Lente, M. D., of Cold Spring.

T. E., aged 19, in good general health, applied at the office on Friday, Nov. 28, 1860, complaining of some "soreness" on the right side of the abdomen. The spot over which this soreness extended was quite circumscribed, and corresponded with the situation of the *caput coli*. He stated that he was running very fast a few hours before, and then, for the first time, felt the pain. There had been no previous constipation or other abdominal difficulty. Being engaged myself, Dr. Richerson, my assistant, prescribed for him. The following day he was sent for and found the symptoms more decided and alarming; the tenderness over the region above referred to had much increased and had extended over a larger surface. The pulse, which was natural at first, was now much accelerated. As the bowels had been freely evacuated by the medicine prescribed on the previous day, he was now put on anodyne treatment, and perfect rest in bed enjoined. Subsequently, the pulse rose to 130, and *veratrum viride* was resorted to; which, after several full doses, reduced the pulse to 70, and at times even less; about this time vomiting supervened, and continued at intervals until death, but not to such a degree as to prevent a due amount of nourishment, which was kept up in the form of beef tea, chicken jelly, etc., and as symptoms of sinking made their appearance, with the addition of brandy, egg-nog, etc. The pain, which, after the second day, extended over the whole of the lower part of the abdomen, and was very severe, was controlled to some extent by the *veratrum*, and when necessary, by morphine, at first by the mouth, subsequently by the hypodermic method and by *enemata per rectum*. Delirium set in early and regularly increased to within twelve hours of death. It was unaffected by the powerful anodynes administered for the pain, nor did these procure any sleep; the patient being wakeful day and night during the last few days of his illness. About once in forty-eight hours, emollient enemata were given, as the tympanitis, which was never excessive, threatened to increase; these generally acted well, and always with temporary relief to the symptoms. On Thursday, seventh day, he seemed better; the abdominal pain and distension were decidedly less, although he had taken less opiate for twelve hours; his pulse was better and he had an hour's sleep. On Thursday night, however, Dr. Richerson was called to him, and found him complaining of severe pain in the epigastrium, or a little below it. There was scarcely any pain on pressure over its original seat. This pain was only controlled by large doses of morphine administered by the hypodermic method. From this date he gradually sank until Saturday, the ninth day of the attack, when he died.

Autopsy, twenty hours after death, weather cold, body in a cold room. No signs of decomposition. Circumstances rendered a rather hurried examination necessary, the father being present. The abdominal cavity only was opened. Upon cutting through the walls, the viscera at the upper part of the cavity were found glued to them by soft adhesions, so that a slight nick was unavoidably made in the small intestine; this was immediately tied up. While separating these adhesions towards the stomach, fluid fecal matter was seen gushing out at a considerable opening in the small intestine; the bowel was accordingly tied on either side of the rent, to prevent further extravasation. The intestines were extensively adherent to the abdominal walls through the medium of a thick, soft layer of lymph, and also to each other. Pockets, more or less considerable, were also formed by these adhesions among the folds of the bowels, containing puriform matter, with shreds of lymph. A large quantity of this was found in the iliac fossæ, especially the right. Both the parietal and visceral layer of the peritoneum was intensely injected, especially on the right side. The stomach, small and large intestines were carefully removed for examination. The stomach was perfectly healthy, as was the large intestine, except its peritoneal coat, which was moderately inflamed.

The *appendix vermiformis*, to the extent of about three-quarters of an inch nearest the *cæcum*, was perfectly healthy in all its coats, and contracted; the free portion extensively diseased, and partially disorganized, its extremity having been destroyed, and a large ragged opening in its walls; the lining membrane dark, thickened, and coated with exudation of lymph. The *cæcum*, and the *ilium* to the extent of about six inches from it, were healthy, with the exception of moderate injection of their peritoneal coat. From this point, throughout several feet of its course, the small intestine was the seat of the most intense inflammation as to all its layers. About a foot from the *caput coli* there existed a patch of gray slough about an inch and a half in length by an inch in breadth, with irregular but well-defined edges. The slough extended through all the coats, but had considerable tenacity. About twelve inches from this point another similar patch was found, and a few inches higher another, this being the seat of the perforation previously alluded to as having been tied off to prevent extravasation. At other points in the neighbourhood of these spots there were patches, which, at first sight, appeared similar; but, upon examination, proved to be only tough lymph, which could be separated with some difficulty from the peritoneum by scraping with the scalpel.

Remarks.—I have searched all the great authorities in vain for a case similar to the above. Neither Rokitansky, Cruveilhier, Carswell, nor Lebert, in his extensive work, mentions such a pathological condition. Rokitansky says gangrene "may occur in large patches in consequence of mechanical hyperæmia brought on by incarceration, or of passive congestion induced by paralysis." The only medical histories that bear any close resemblance to this are to be found in the *Pathological and Practical Researches on the Diseases of the Stomach and other Viscera of the Abdomen*, by Dr. Abercrombie, published in Edinburgh in 1828. But, in these cases, there was excessive distension of the intestine, which, itself, or in connection with other causes, might give rise to gangrene; in which case the slough would be somewhat extensive, as was the fact in Dr. Abercrombie's cases.

This case was presented to the Pathological Society of New York with the dried specimen, and a very accurately coloured drawing, very kindly made for me by Professor Weir, of West Point, from the specimen in a recent state. Considerable discussion was elicited, but none of the members had met with a parallel case, nor could any one explain the ultimate cause of the gangrene. It was suggested by one that it might have been due to *emboli.*

Cold Spring, May 7, 1861.

Case of Gunshot Wound, in which a Leaden Bullet remained twenty years in the Walls of the Heart. By Galusha B. Balch, M. D., of North Lawrence, N. Y.—In the year 1840, a boy about fourteen years of age, by the name of John Kelly, was accidentally shot at Chatham Four Corners, Columbia Co., N. Y. He was a labourer on the Western R. R. The bullet entered his right shoulder through the upper border of the trapezius muscle about two inches from the acromion process. Three physicians were called in attendance who probed the wound, and said the ball lay about four or five inches from where it entered, in a direction toward the cavity of the chest near the sternal end of the clavicle.

There was but little hemorrhage and no great local disturbance at the time. But for reasons unknown to me, they did not think it advisable to remove the bullet. In about six weeks the boy was able to resume his work in part. He gradually gained his health, and became to all appearances a well man. He afterwards removed to Clinton Co. In 1845 he was attacked with pneumonia of the upper part of the right lung. Dr. Orvill Terry, of Redford, Clinton Co., attended him during this illness, and subsequently to the time of his death. From him I received the account of the case from 1845 to the 14th day of June, 1860, the day of Kelly's death.

The patient's illness at that time was very severe. His recovery was not expected. Then, and for the first time, was noticed a very tumultuous action of the heart, which remained after his recovery from the pneumonia, and continued to increase. At times the beating of his heart could be seen and heard at the distance of ten or twelve feet. Valvular disease was diagnosticated a few years before death.

His last illness was the result of taking cold. Pneumonia again set in on the first of June, 1860, and the heart's action increased rapidly; dispnœa great. His right arm and hand became purple and cold two days before his death.

The *post-mortem* examination was commenced with the view of finding the bullet and of examining the diseased condition of the heart and lungs, for we believed that the predisposing cause of the disease was the bullet which he had received twenty years before.

I dissected the shoulder and part of the neck; found the right internal jugular enlarged: the right external jugular entirely closed about one-fourth of an inch from where it entered the internal jugular. In the right subclavian artery, at the thyroid axis, was a large ossific deposit. It did not appear to be an ossification of the artery, but a deposit in the artery; the largest deposit was basin shaped; it was five lines across the top and three in depth; I found no ossific deposits elsewhere. I then opened the thorax, removed the right lung, found the upper portion in the first or congestive stage of pneumonia; the left lung healthy, no tubercles in either lung.

Before removing the heart it was noticed to be very soft and flabby; a hard lump could be felt in the lower part of it. The heart was two or three times its natural size; it was not weighed.

The pericardium was very adherent, especially on the right side of the heart, which appeared to be much more diseased than the left; as yet the ball had not been seen. I now introduced my finger into the right ventricle, through the ascending vena cava and right auricle, for the purpose of examining the lump above mentioned: found it to be in the wall of the right ventricle: examined the outside, found no scar; then I cut from the outside down upon this lump, and found it to be a leaden bullet imbedded there, where it now is and has been seen by many professional friends.

Since the examination just described, I have examined the heart with a microscope and found it to have undergone Quain's fatty degeneration.

NORTH LAWRENCE, N. Y., Jan. 18, 1861.

Diagnosis of Traumatic Tetanus. By H. A. JONES, M. D., of Chicago, Illinois.

In your number for April, 1861, I notice a case of "Tetanus" reported as cured by the use of chloroform and opium. Now, in this and similar cases reported in other journals where recovery took place, I am led by the recountal of symptoms to doubt the correctness of the diagnosis made, and to consider the disease to have been "Traumatic Hysteria," as described by the venerable Dr. Knight, of New Haven, a disease of comparative minor gravity. That gentleman was accustomed to instruct his pupils that acute traumatic tetanus never manifested its initiatory symptoms before the fifth day (usually about the seventh), in a rigidity and soreness of the muscles of the neck and of deglutition; the jaws being at no stage of the disease *entirely* closed; the functions of the body naturally performed, or nearly so; the specific senses and the intellect normal; the issue being generally fatal within five days from the appearance of the disease. He distinguished this from the affection called "Traumatic Hysteria," in that the latter manifested itself *always* before the fifth day; the muscles of the *part wounded* being those primarily affected, the masticatory muscles, in their turn, *completely closing* the jaws; the specific senses delusory and the intellect obscured during the spasms; the termination being *always* favourable, though sometimes protracted.

I have not met with these views in any of the more recent works on surgery, while in my own, and the experience of many others, they have been proved entirely reliable. I have, therefore, taken the liberty of quoting them for the benefit of "whom it may concern."

Case of Poisoning by Corrosive Sublimate. By JAS. L. ORD, M. D., of St. Barbara, Cal.—At 10 A. M., a short time since, my cook was accidentally poisoned by tasting a solution of corrosive sublimate while making some ammoniated mercury. Half an hour after drinking the poison he came into my office saying that he was poisoned by tasting some of the solution which I had cautioned him against, with his face much swollen, eyes bloodshot and protruding from the sockets. He said that he would certainly die if he was not soon relieved. I told him to go and lie down, that I would give him something to relieve him in a few minutes. Not having any eggs in the house at the time, I ran across the street to get some, which did not require more than two minutes. Upon my return, I found him leaning against the fence in the back yard, not having been able to reach his room some twenty yards off, vomiting blood, and crying out that he would certainly die. As soon as I could break them open I gave him half a dozen eggs, yolks and whites, which almost instantaneously relieved the vomiting. He felt so much better that he did not lie down at all, but continued his duties as before. At times, within the next two hours, he complained of a desire of vomiting, but he did not. I gave him a tumbler of water with a tablespoonful of flour stirred in it—having complained of considerable thirst and burning of stomach. He did not eat anything, and drank only a cup of tea that day. Nothing more was given him, and no inconvenience was felt next day, but a little weakness, and soreness about the epigastrium.

Remarkable Case of Trance. By W. Turk, M. D., Surgeon U. S. N. (Communicated in a letter from F. B. Richerson, M. D., of Cold Spring, N. Y.)—The following letter was found in the papers of the late Honourable J. K. Paulding, Esq., the novelist, at one period Secretary of the Navy, and was presented to me by his son, W. J. Paulding, Esq. Finding it exceedingly interesting, I send you a copy for publication. F. B. R.

"In the month of January, 1814, being surgeon of the U. S. Frigate President, commanded by Commodore John Rodgers, cruising off the coast of South America, a sailor, belonging to one of the tops, about 23 years of age, named —— ——, burst a vessel in his lungs and was brought down to me, about suffocating with the sudden and great discharge of blood. I succeeded in stopping the hemorrhage; he was confined to his cot, and put upon low diet, and the use of such medicines as the case demanded. During my attendance upon him I discovered nothing in his conversation or actions different from ignorant, rough, profane men in the same station. My mates said that to them he was at times insolent, swearing terribly at their refusal of such things as would have been injurious to him, saying they wished to starve him. He was to all appearances extremely illiterate. After doing well for some time, a vessel having the appearance of an enemy's frigate hove down upon us, and as all hands were at quarters and a fight expected to commence in a few minutes, knowing the spirit that animated all on board, I thought proper, before descending to the cockpit, to call upon this man, and forbid his making any attempt to move, as it might prove fatal to him. He promised to obey faithfully; but the moment he heard the sound of the first gun he sprang upon deck and ran to the gun where he was quartered. The excitement was so great that the blood burst forth from his mouth and nostrils in a full stream, and in this deplorable condition he was brought down to me in the cockpit.

"I with some difficulty saved him from immediate death. He was returned to his berth and put upon the same course as before The weather being very hot and calm, I hung his cot between two ports on the gun deck, from which he was obliged to be removed to the berth deck whenever we were called to quarters at night, a strange sail being near. He had occasional discharges of blood and became much debilitated. During all this time, being apprised that his dissolution was nigh, I do not remember of witnessing any change in his expression or feelings, as far as the state of his soul was concerned. Soon after dinner-time (say 2 or 3 o'clock), Dr. Birchmore reported his death to me. The usual orders were given to his messmates to lay out the body and watch it. Dr. Birchmore called upon me to inform me that the supposed dead man had revived and addressed his messmates in such a manner as to astonish every one, and bring tears from the eyes of all who heard him; that he then addressed himself to the surgeon's mates, and had now sent for me. I immediately repaired to the spot, and found him reclining upon and supported by a messmate, a doctor, at each wrist, trying in vain to find a pulse. He was universally cold, without any perceptible pulsation, his eyes bright and animated, his speech strong and distinct, without any discharge of blood from the lungs, although he had been exercising them so long. All the men not upon duty on deck, surrounded the sick bay, and were gazing with wonder at the scene. I was then brought to attend to his address, which was long, and consisted of language strong and appropriate, great fluency, good grammar, and words well put together.

"My surprise was too great to permit me to recollect more than a small part of what he said. He declared that he was dead, that his spirit had been separated from his body, that he had beheld the glories of the other world, of which, if language could convey an idea, he was not at liberty to give a description; that he was only allowed a short time to return to earth and give the advice he was now communicating to certain officers and men. He was extremely solemn and impressive, and what he uttered was in such a correct and pure style, that it might have been heard with satisfaction from a pulpit, delivered by a learned divine. After finishing with me, he ordered me to send for Commodore Rodgers, as he said he must deliver a message to him before he finally quit us. I waited upon the Commodore and delivered the order. The Commodore stared, and for a moment hesitated how to act, fearing some deception, and the ill effects it might have upon the minds of superstitious seamen; but he descended, when such a scene presented itself as is seldom witnessed by man. Imagine to yourself for a moment such a man as Commodore Rodgers in a sick bay, by lamplight, surrounded by a hundred or more witnesses, standing before a common sailor, supposed to have been dead, who commenced to address him in words like these: 'I have sent for you, sir; some hours since I would have trembled at your form and feared your displeasure; but now, sir, I am your superior, being a messenger from heaven to you; therefore, listen to what I shall say.' He then touched in a handsome manner upon the different duties and relative situation of commander and men, dwelt upon the great responsibility of his station, his power to do good, the force of good example, humanity, etc. etc.

"When he had concluded, his head sunk upon his shoulder and he appeared once more to be lifeless. The Commodore retired to his cabin, sent for me, and requested from me a philosophical explanation of what had happened. I endeavoured to give one, which it would take up too much time to repeat; but there was and ever will be one insurmountable difficulty in the case, without admitting something like inspiration, to wit, how or in what manner he acquired the knowledge of such excellent language, and delivered himself with such fluency and ease, mostly and clearly being an uneducated, rough, common topman. Not knowing what might take place after what I had just witnessed, I laid him down and retired to rest. Late at night I was called out of my room to see a man who was very ill, and hanging in a hammock near the sick bay. After bleeding him and giving him an anodyne, I went in haste into the bay to get something; no one was present but myself; all hands not on duty were sleeping soundly around me; a solitary lamp threw a sickly light. Upon turning my head aside, *horribile dictu*, what struck my eyes but the aforesaid corpse sitting up in his bed, fixing his glaring eyes upon me. I became motionless and almost petrified, when I was relieved from this unpleasant situation by his exclaiming, with a loud voice and much authority, 'Give me some water.' I never obeyed an order so quickly before; springing to a tin mug that stood near me, I approached, presented it to his lips, he drank of it, and closed his eyes forever. The next morning he was buried, or committed to the deep. I never saw more anxiety depicted upon the human face than every man discovered during the reading of the funeral service. Among six hundred and fifty men I believe not a tearless eye could be found, and when the body was slid into the sea every one, I was about to say, instinctively looked over the side, when their surprise was not lessened by beholding the body arise to the surface once or twice before it finally disappeared. It was astonishing the effect this affair had upon the language and countenances of the men for some days, especially those who had heard the address. The Commodore was delighted to learn that so far from representing fighting to be criminal, he spoke of love of country, and recommended discipline, attention to orders, obedience, and performance of duty in time of action."

Note to a Report of a Case of Destruction of a Solid Ovarian Tumour by Incision followed by Suppuration. By D. PRINCE, M. D.

This case was reported in *American Journal of Medical Sciences* for July, 1850, page 267. This treatment was practised in 1847. In 1849, a healthy child was born. The patient has recently been heard from. She has had entire immunity from a return of the disease, and has had since several births.

Sequel to the Case of Extirpation of the Parotid Gland. Reported in this Journal for July, 1860, page 57. By D. PRINCE.

The patient seemed at the date of the report, about three months after the operation, to be entirely free from disease; but in a short time afterwards, indurations began to show themselves lower down upon the neck, which became painful, and one of them grew to be an inch and a half in diameter.

No growth appeared in the cicatrix, but portions of the line of union became ulcerated exactly as in lupus exedens.

The patient died about nine months from the time of the operation, gradually exhausted.

No post-mortem examination.

DOMESTIC SUMMARY.

New Method of Treating Fractures of the Femur.—Dr. GURDON BUCK read before the New York Acad. Med. (March 30th, 1861) an account of a mode latterly employed by him in the treatment of fracture of the femur, in which the long splint is entirely dispensed with, while constant and uninterrupted extension is kept up by means of a weight and pulley. This method was suggested to him by observing its happy application by Dr. H. G. Davis, to the treatment of morbus coxarius.

The treatment is as follows: "A roller bandage is commenced at the toes in the usual way, and continued to the ankles, where it is temporarily arrested. A band of adhesive plaster two and a half to three inches broad, and long enough to allow the middle of it to form a loop below the sole of the foot, and the ends to extend above the condyles of the femur, is then applied on either side, in immediate contact with the limb, from the ankle upwards. Over this the bandage is continued as high up as the plaster. A thin block of wood of the width of the plaster, and long enough to prevent pressure over the ankle, is inserted into the loop, and serves for the attachment of the extending cord, which is fastened to an elastic rubber band (such as is used for door springs), that passes round the block. By this arrangement *elasticity* is combined with the extension. The limb is now prepared to be put under extension. The arrangement for the pulley is very simple. A strip of inch board three inches wide is fastened upright to the foot of the bedstead, and perforated at the height of four or five inches above the level of the mattress. Through this hole the extending cord is to be passed, and on the further side of the strap a screw pulley should be inserted at the proper level over which the cord with the weight attached is to play. The footboard of the bedstead, if there is one, may be perforated at the proper level, and the screw pulley inserted in the further side of it, so as to answer equally well. To allow the application of lotions to the thigh, during the first few days of treatment, the ends of the adhesive bands should stop short at the condyles of the femur, and be turned down. They may afterwards be replaced upon the thigh and the bandages continued over them, preparatory to the application of the coaptation splints which should be added at this stage of the treatment. The coaptation splints, which may be of the ordinary sort, should be secured by those elastic bands, like suspender webbing fitted with buckles; these have the advantage of keeping up uniform concentric pressure as the limb diminishes from the subsidence of swelling. Counter-extension must be maintained by the usual perineum band lengthened out in the direction of the long axis of the body, and fastened to the head of the bedstead. India-rubber tubing of three quarters of an inch calibre stuffed with a skein of cotton lamp wick makes an excellent perineum strap. A piece of two feet long with a ring fastened at each end answers this purpose admirably. A thin wedged-shaped hair cushion, to raise the heel above the mattress, and a bag filled with bran or sand to place on the outside of the foot to prevent rotation outwards, complete the appliances requisite to carry out this method of treatment. There need be no delay in its application. The sooner after the occurrence of the injury the limb is put up the better. The contraction of the muscles is thus antagonized from the outset, and the rough ends of the fragments are prevented from fretting the soft parts.

The author then gives twenty-one cases in detail where this treatment was employed; and the results, as shown by *actual measurement*, are equal to any that have hitherto been obtained. Dr. Buck claims for the apparatus the following advantages: I. It maintains *uninterrupted* and *efficient extension* without producing intolerable pain, excoriations, sloughing, and tedious sores. II. It diminishes very materially the suffering of the patient and the irksomeness of long confinement to one position. There is no inconvenience attending the evacuation of the bowels. III. It is cheap and easy of application. IV. It is not liable to become deranged, thus rendering it unnecessary for as frequent visits on the part of the surgeon as when the ordinary apparatus is applied. The author considers it very necessary to apply coaptation splints, for reasons already given."—*American Med. Times*, March 30, 1861.

Complete Osseous Anchylosis of the Knee-Joint. Successfully Operated on by Barton's Method.—Dr. CHAS. A. POPE reports (*St. Louis Med. and Surg. Journ.*, May, 1861) a case of this. The subject of it was a healthy man forty years of age, who ten years ago was accidentally shot, the ball passing just below the right knee-joint. The articulation became involved in the inflammation, and anchylosis resulted.

"The limb was permanently flexed at near a right angle. For long years he had worn a wooden peg, with the knee resting in a socket at its upper extremity, for purposes of locomotion. In walking, the foot and leg projected inconveniently backward, whilst in sitting the wooden appendage stuck out still more awkwardly in front. So that in this, as in other respects, the annoyance was so great, that he had been led to seek relief, if possible, by an operation. The anchylosed limb was, as usual, smaller than its fellow.

Dr. Pope operated on the 14th March as follows:—

"The patient being under the full effect of chloroform, Dr. P. made a long semicircular incision through the integuments, commencing at the upper part of the internal condyle of the femur, sweeping round in front just above the superior edge of the unrecognizable patella, and terminating over the external condyle. This cap-shaped flap was carefully raised from the bone, and dissected well back to the convenient distance of nearly five inches. A fine saw was now entered at the most prominent part of the bony angle, the apex of the knee, and directed obliquely upward and backward toward the posterior surface of the femur a short distance above the condyles. A second section was then made with the saw, from the front of the femur, so as to fall on the first without entirely severing the continuity of the bone. A few posterior fibres were purposely left in order to prevent any danger to the popliteal vessels, and also to assist by their slight irregularity when broken, in the subsequent adjustment of the bones. The flat wedge-shaped piece of bone thus removed measured 4½ inches long, 1½ inches thick; and 3½ inches at its broadest part. The angle removed was 91°, that being the complement of the angle of deformity. The limb was now laid on a double inclined plane, the angle of which could be varied at will, by means of a screw. Having closed the wound by points of the interrupted suture, a moderate extension was made on the foot, which caused the rupture of the thin posterior portion of bone left undivided. The patient bore the operation well, having felt no pain."

The patient was left under the care of Dr. Jno. S. Dewey, who writes to Prof. P. that the result was entirely satisfactory. He states that he had seen the patient wheeling a heavily loaded wheelbarrow. He walks without a stick ordinarily, and the angle at which his knee is anchylosed is that which he himself chose.

Surgical Treatment of Epilepsy.—The *Cincinnati Lancet and Observer* (June, 1861) has an interesting paper on this subject, by Dr. J. S. Billings, with some valuable statistical tables which we copy.

1. *Trephining the Skull.*—This operation has been performed in a number of cases in which the disease resulted from injury to the head. Dr. B. gives the following table of seventy-two cases:—

Operator.	Result.	Where reported.
Coates	Cure	Edinburgh Medical and Surgical Journal, 1806.
Wells	Cure	Trans. of Soc. for Imp. of Medicine and Surgery, 1812.
Howship	Death	Abercrombie on Diseases of the Brain, p. 196.
Crampton	Cure	Dublin Hospital Reports, vol. i.
Berard	No change	Gazette des Hopitaux, April, 1846.
Birch	Cure	Sir A. Cooper's Lectures on Surgery, vol. i.
Riboli	Cure	London Medical and Surgical Journal, 1826.
Rhodius	Cure	Centur 1, obs. 66.
Steidele	Death	Chirurgische Beobachtungen.
Farre	Death	Sir A. Cooper's Lectures, vol. i. p. 170.
Fricke	Death	Bruns' Chirurgerie.
Riencke	Death	Bruns' Chirurgerie.
Marchetti	Cure	Dictionnaire des Science Médicale, art. Epilepsie.
Boyer	Death	Dictionnaire des Science Médicale, art. Epilepsie.
Boncher	Cure	Dictionnaire des Science Médicale, art. Trepan.
La Motte	Cure	Dictionnaire des Science Médicale, art. Trepan.
B. Bell, two cases	Both fatal	Bell's Surgery, vol. ii.
Do. do.	No change	Bell's Surgery, vol. ii.
Buch	Cure	Travers on Constitutional Irritation.
Blake	Cure	London Medical and Physiological Journal.
Johnson	Cure	Virginia Medical Journal, 1837.
Howard	Improvement	Transactions of State Medical Society of Ohio, 1843.
Hulihen	Cure	Reported to me by Dr. Boerstler.
Gross, three cases	All fatal	Gross' Surgery, vol. ii.
Kite	Cure	Bruns' Chirurgerie.
Robertson	Cure	Gazette Médicale, 1848.
Wurm	Cure	Surgical Writings of Schmucker, 1776.
Gross	No change	Gross' Surgery, vol. ii.
Tripler	Death	
Palmer	Cure	London Medical Gazette, vol. xvii.
Warren, two cases	Cured	Boston Medical Magazine, vol. i.
Brainard	No change	Chicago Medical Journal, 1859.
Do.	Improvement	Chicago Medical Journal, 1859.
Do., four cases	All cured	Chicago Medical Journal, 1859.
Elliott	Cure	Transylvania Journal of Medicine, vol. ii.
Dudley	Improvement	Transylvania Journal of Medicine, vol. i.
Do., four cases	Cured	Transylvania Journal of Medicine, vol. i.
Rogers	Improvement	New York Medical and Physiological Journal, vol. v.
Dixon	Cure	Boston Medical and Surgical Journal, vol. xxxi.
Pancoast	Cure	Philadelphia Medical Examiner, 1849.
Pope	Cure	St. Louis Medical and Surgical Journal, vol. vii.
Guild	Cure	American Journal of Medical Sciences, vol. iv.
Hayward	Cure	Boston Medical and Surgical Journal, 1838.
Hobson	Cure	Western Lancet, vol. ix.
Do., two cases	Cured	Western Lancet, vol. ix.
Do.	No change	Western Lancet, vol. ix.
Yandell	Improvement	Western Journal of Medicine and Surgery, vol. vii.
Cadwall	Cure	Boston Medical and Surgical Journal, vol. xxvii.
Hayward	Cure	Boston Medical and Surgical Journal, vol. xxviii.
Trowbridge	Cure	Boston Medical and Surgical Journal, vol. xxviii.
Do.	Cure	Boston Medical and Surgical Journal, vol. xxviii.
Hayward	Improvement	Boston Medical and Surgical Journal. vol. xxiv.
Mitchell	Cure	Materia Medica and Therapeutics.
Wells	Improvement	Essays on Pathology and Therapeutics, by Dickson.
Campbell	Cure	American Journal of Medical Sciences, vol. xii.
Yeates	Cure	American Journal of Medical Sciences, Jan. 1860.
Blackman, one case	Improvement	
Do., two cases	Death	
Edwards, two cases	Death	

Making in all seventy-two cases, of which sixteen proved fatal, or $22\frac{2}{9}$ per cent. Forty-two cases are reported as cured, four unchanged, and the remainder improved, but not entirely relieved.

In addition to those mentioned in the table, several cases have been reported by Dr. Stone, of New Orleans, but Dr. B. has not been able to obtain access to the journals containing them.

This operation has been also recommended in cases which had not been the result of injury, but the statistics have not been collected.

2. *Ligature of one or both Carotids.*—The following table gives the result of all the cases in which this operation has been performed, which Dr. B. has been able to find:—

Operator.	Result.	Where reported.
Boileau	Cure . . .	Journal Univ. des Science Médicale, 1825.
McClellan . . .	Improvement	American Medical Review, vol. iii.
Becton	No change .	North American Medical and Surgical Journal, 1827.
Preston, three cases	All improved	Trans. Med. and Phys. Soc. of Calcutta, vols. v. and vi.
Hamilton . . .	Cure . . .	Buffalo Medical Journal, vol. ii.
Angell	Cure . . .	North American Medico-Chirurgical Review, 1858.
Do.	Death . .	North American Medico-Chirurgical Review, 1858.
Brown, U. S. A. .	Cure . . .	Peninsular Journal.
Weber	No change .	Peninsular Journal, 1859.

Making in all eleven cases: four cures, four improved, two no change, and one death.

The theory which gave rise to this operation was, that the disease was caused by an excess of blood carried to the head, as evinced by the flushed face and turgid, swollen condition of the veins of the neck during an attack.

—

Castration for Epilepsy.—Dr. L. ROOKER records (*Cincinnati Lancet and Observer*, May, 1861) a case of epilepsy in a man, 35 years of age, resulting from self-abuse, to desist from which he found impossible. His expression was idiotic, and he avoided society, particularly that of females, for which last he had an abhorrence. On the 21st of January, 1861, Dr. R. performed double castration, and at the date of the last report (April 20) the patient is said to be improving admirably, and has had no fit since the operation. He says he has lost his inclination for masturbation.

We hope the author will report the future history of the case, as it would be premature as yet to pronounce the operation successful.

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Ligature of the Primitive Carotid Artery, for Wound of the Internal Maxillary Artery; Recovery.—Dr. J. C. HUTCHINSON, Professor of Operative Surgery in Long Island College Hospital, records (*Am. Med. Times*, April 20, 1861) a case of this. The subject of it was a blacksmith, 35 years of age, who, on the 11th Sept., received several wounds with an iron punch, the most serious of which was half an inch in front of the external left auditory meatus. He bled profusely at the time, and again for three or four hours afterwards. The bleeding recurred on the 24th Sept., but was stopped by the application of the solution of persulphate of iron. Early in the evening the hemorrhage again recurred; the patient was very pallid, and as the source of hemorrhage was deeply seated, and the vessel could not be reached at the point of injury without making extensive incisions which would involve the parotid gland and the important nerves and vessels it contains, Dr. Hutchinson thought it judicious to ligate the common carotid artery. This he did with the counsel and assistance of Drs. Hamilton and Kissam. He made the usual incision, and tied the vessel above the omo-hyoid muscle. This completely controlled the hemorrhage. The ligature came away on the 22d day, and the patient improved steadily. Owing to the division of some of the branches of the facial nerve, by the incisions made to enlarge the wound, there is paralysis of the left orbicularis muscle.

Coffee as a Remedy for Hooping-Cough.—Strong coffee was some years since recommended by M. Jules Guyot as a specific for hooping-cough. The editors of the *Boston Med. and Surg. Journal* (No. for May 16, 1861) state that they have tried it in several instances with marked effect. "In one case," they say, "the patient being a little girl, six years of age, there was not a single 'whoop' after she began to take it. She took a tablespoonful and a half of very strong coffee, sweetened, but without milk, three times daily. A younger child, in the same family, was well of the disease in three weeks; no other remedy was used in either case. In another instance, in which we have recently tried it, the same happy result followed, the 'whooping' symptom being at once arrested, and the complaint coming to a speedy termination. It is difficult to fix the dose definitely, and this may account for the unsatisfactory result in one or two instances we have heard of, in which a small dose was given. Another important consideration which should not be lost sight of, is, that three-quarters, probably, of what is drank for coffee, is made from nothing but peas or beans. The only sure method is to get the coffee berry itself, and have it burnt and ground under one's own eye. The decoction should then be given as strong as possible, and in a quantity only short of enough to cause the unpleasantly stimulating effects of this beverage. Children take it very readily. The last patient referred to above, was only eighteen months old, and took, once a day, half a cup of coffee thus prepared, without the least noticeable injurious effect."

Confluent Smallpox in a Pregnant Woman—Child Marked.—Dr. W. C. Corson records (*Am. Med. Times*, April 20th, 1861) a case of confluent variola occurring in a woman at the fifth month of pregnancy, from which she entirely recovered without any symptom of abortion. About ten days, however, after recovery, she aborted, and the fœtus was marked with the variolous eruption.

Absence of the Uterus in Three Sisters in a Family of Five.—Dr. R. Nelson records (*Am. Med. Monthly*, June, 1861) a curious example of this. The family consisted of five sisters, of whom the first, second, and fourth had no womb, while the third and fifth possessed that organ. The *first* and eldest is a widow, tall, bony, slim, dark eyes. The *second* is also a widow, hair light, gray eyes. The *third* is married, and the mother of four children, blue eyes, full mammæ. The *fourth* is now married to her second husband, spare, dark hair, blue eyes. The *fifth*, seventeen years of age, has full mammæ. The first, second, and fourth, who are deficient in a uterus, are thin, with small mammæ: and the third and fifth are stout and have full mammæ. The sexual desires of the first, second, and fourth sisters were ardent, and marital intercourse was enjoyed by them.

FISKE FUND PRIZE QUESTIONS.

The Trustees of the Fiske Fund, at the annual meeting of the Rhode Island Medical Society, held in Providence, June 19, 1861, announced that they had awarded a premium of one hundred dollars to Daniel Denison Slade, M. D., of Boston, for the best dissertation on "*Aneurism, its varieties and their appropriate treatment.*" And also, that they had awarded a premium of one hundred dollars to E. S. Gaillard, M. D., of Baltimore, for the best dissertation on "*Ozone, its relations to health and disease.*"

They propose the following subjects for 1862:—

1st. What evidence is there that inflammatory and febrile diseases have undergone any general change of type?

2d. Gunshot wounds, particularly those caused by newly invented missiles.

For the best dissertation on the first subject, the Trustees will pay the sum of one hundred dollars, and on the second subject, fifty dollars.

Every competitor for a premium is expected to conform to the following regulations, viz.:—

To forward to the Secretary of the Fiske Fund Trustees, on or before the first day of May, 1862, free of all expense, a copy of his dissertation, with a motto written thereupon, and also accompanying a sealed packet, having the same motto inscribed upon the outside, and his name and place of residence within.

Previously to receiving the premium awarded, the author of the successful dissertation must transfer to the Trustees all his right, title, and interest in and to the same, for the use, benefit, and behoof of the Fiske Fund.

Letters accompanying the unsuccessful dissertations will be destroyed by the Trustees, unopened, and the dissertations may be procured by their respective authors, if application be made therefor within three months.

Charles W. Parsons, M. D., of Providence,
Henry E. Turner, M. D., of Newport, } *Trustees.*
Jarvis J. Smith, M. D., of Gloucester,
S. Aug. Arnold, M. D., *Secretary of the Fiske Fund Trustees.*

JEFFERSON MEDICAL COLLEGE—1861-2.

The Session will commence on Monday, the 14th of October, with a General Introductory Lecture by one of the Professors. The regular lectures will begin the day after. The Session will terminate on the last day of February.

Robert M. Huston, M. D.,	Emeritus Professor of Materia Medica and General Therapeutics.
Charles D. Meigs, M. D.,	Emeritus Professor of Obstetrics and Diseases of Women and Children.

Institutes of Medicine,	By Prof.	Robley Dunglison, M. D.
General, Descriptive and Surgical Anatomy,	"	Joseph Pancoast, M. D.
Chemistry,	"	Franklin Bache, M. D.
Institutes and Practice of Surgery,	"	Samuel D. Gross, M. D.
Materia Medica and General Therapeutics,	"	Thomas D. Mitchell, M.D.
Practice of Medicine,	"	S. Henry Dickson, M. D.
Obstetrics and Diseases of Women and Children,	"	William V. Keating, M.D.

Demonstrator of Anatomy,	Ellerslie Wallace, M. D.

Clinics will be held regularly during September; and every Wednesday and Saturday in October, and during the course, Medical and Surgical cases will be investigated, prescribed for, and lectured on before the Class. During the year ending March the first, 1861, a vast number of medical and surgical cases were treated, and several hundred surgical operations were performed; among them many of the most important.

The lectures are so arranged as to permit the student to attend the clinics of the Pennsylvania Hospital, and the Philadelphia Hospital.

On and after the 1st of October, the dissecting-rooms will be open, under the direction of the Professor of Anatomy and the Demonstrator.

FEES.

Matriculation, which is paid only once,	$ 5
To each Member of the Faculty $15,	105
Graduation,	30

ROBLEY DUNGLISON, M.D.,
Dean of the Faculty.

HARVARD UNIVERSITY.

MASSACHUSETTS MEDICAL COLLEGE.

The annual course of Medical Lectures of Harvard University will commence at the Massachusetts Medical College, in North Grove Street, Boston, on the first Wednesday of November, 1861. The regular course will be as follows:—

Obstetrics and Med. Jurisprudence,	by	Professor	D. Humphreys Storer, M. D.
Morbid Anatomy,	"	"	John B. S. Jackson, M. D.
Clinical Medicine,	"	"	Henry I. Bowditch, M. D.
Anatomy and Physiology,	"	"	Oliver W. Holmes, M. D.
Theory and Practice of Medicine,	"	"	George C. Shattuck, M D.
Surgery,	"	"	Henry J. Bigelow, M. D.
Chemistry,	"	"	John Bacon, M. D.
Materia Medica	"	"	Edward H. Clarke, M. D.

Demonstrator, David W. Cheever, M. D.

Clinical, Medical, and Surgical Instruction will be given at the Massachusetts General Hospital, with Surgical Operations.

Collateral special medical instruction will also be given at the Hospital by Lectures and otherwise, by Drs Bowditch, Abbot, and Ellis.

Abundant material is afforded for the study of Practical Anatomy. The Room devoted to this department is open day and evening, and lighted by gas.

Fees for the Lectures, $80; Matriculation fee, $3; Graduation fee, $20.

Good Board can be obtained at $2 50 to $5 00 per week. Boarding places provided on application to the Janitor at the College.

Students are requested, upon coming to Boston, to call upon the Dean.

D. HUMPHREYS STORER, *Dean of the Faculty.*
July 1, 1861. *No. 132 Tremont Street, Boston.*

PENNSYLVANIA COLLEGE—MEDICAL DEPARTMENT.

NINTH STREET, BELOW LOCUST, PHILADELPHIA.

The Annual Session of this Department commences on the second Monday in October, and terminates early in March. EXAMINATIONS are given daily in the College by the members of the Faculty. HOSPITAL INSTRUCTION is furnished gratuitously. A CLINIQUE is conducted at the College, affording ample opportunity for the study of Medical and Surgical cases and Diseases of Females.

The Rooms for Practical Anatomy are open early in September.

FEES.—Matriculation, $5; For each Professor's ticket, $15; Practical Anatomy, $10; Graduation, $30.

FACULTY.

B. HOWARD RAND, M. D., Professor of	Medical Chemistry.
HENRY HARTSHORNE, M. D., "	the Theory and Practice of Medicine.
LEWIS D. HARLOW, M. D., "	Obstetrics and Diseases of Women and Children.
WILLIAM S. HALSEY, "	the Principles and Practice of Surgery.
WM. HEMBEL TAGGART, M. D., "	Materia Medica and Therapeutics.
JAMES AITKEN MEIGS, M. D., "	the Institutes of Medicine.
WM. H. GOBRECHT, M. D., "	Anatomy.

THEODORE A. DEMMÉ, M. D., Demonstrator of Anatomy.

☞ For further information, address,

LEWIS D. HARLOW, M. D., *Dean*,
No. 1023 *Vine Street, Philadelphia.*

BELLEVUE HOSPITAL MEDICAL COLLEGE—NEW YORK.

ANNOUNCEMENT FOR 1861–62.

The Trustees and Faculty announce, with much pleasure, the organization of this College, with a corps of thirteen Professors, and a full course of Lectures during the next autumn and winter.

FACULTY.

ISAAC E. TAYLOR, M. D., *President.*
BENJAMIN W. McCREADY, M. D., *Secretary.*
R. OGDEN DOREMUS, M. D., *Treasurer.*

JAMES R. WOOD, M. D., Professor of Operative Surgery and Surgical Pathology.
FRANK H. HAMILTON, M. D., Professor of Military Surgery, Fractures, and Dislocations.
LEWIS A. SAYRE, M. D., Professor of Orthopedic Surgery.
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STEPHEN SMITH, M D., Professor of the Principles of Surgery.
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PRELIMINARY TERM.

A preliminary term will commence on Wednesday, September 18, 1861, and continue until the beginning of the regular term. In addition to daily instruction in the Hospital wards, and clinical lectures, at least three lectures will be given daily on subjects of practical importance, by members of the Faculty, during this term. Among the subjects which will be taken up during the preliminary term are the following:—Organic Affections of the Uterus, by Prof. Taylor; Uterine Displacements, by Prof. Barker; Inflammatory Diseases of the Uterus and Appendages, by Prof. Elliot; the Thoracic Viscera, by Prof. Childs; Auscultation and Percussion, by Prof. Flint; Syphilis, by Prof. Hamilton; Surgical Affections of the Genito-Urinary Apparatus, by Prof.

BELLEVUE HOSPITAL MEDICAL COLLEGE—Continued.

Wood; Endosmosis and Exosmosis, with their Practical Applications, by Prof Doremus.

The attention of students and practitioners is invited to the variety and practical importance of the subjects which will be treated of during the preliminary term. Although attendance is not required on the part of the student, it is designed to render this term, not a nominal, but an actual extension of the period of instruction.

Dissections may be prosecuted during this term as well as during the whole of the regular term.

REGULAR TERM.

The regular term will commence on Wednesday October 16, 1861, and end in the early part of March, 1862.

During the regular term the lectures will be so arranged as not to interfere with attendance in the Hospital wards. Ample time will be allowed for accompanying the visiting physicians and surgeons in their daily rounds, attending clinical lectures in the Hospital amphitheatre, witnessing surgical operations, and autopsical examinations, without conflicting with any of the didactic lectures.

This College, having been established in connection with the Bellevue Hospital, offers peculiar advantages, arising from the fact that the lectures in all the departments of instruction will be given within the Hospital grounds. The Professors in all the practical branches being connected with the Hospital, either as visiting physicians or surgeons, all the important subjects pertaining to Surgery, Obstetrics, Therapeutics, and the Practice of Medicine, can be amply illustrated by cases under observation in the Hospital wards, and by autopsical examinations, simultaneously with their consideration in the lecture room; loss of time in going to and from the Hospital is saved; the student is always at hand when cases of accident are received, or operations in Surgery and Obstetrics suddenly called for; and there will be no encroachments of didactic and clinical instruction upon each other.

The aim of the Faculty of the College, with the co-operation of the Commissioners of Public Charities and Correction, is to make the immense Hospital resources at their disposition, available to the fullest extent for purposes of instruction. In 1860, more than *eleven thousand patients* were received into Bellevue Hospital, and over *four hundred births* took place in this Hospital during the year. The large Hospital recently erected on Blackwell's Island, will also be open for medical instruction, and students will be conveyed to the Island by the Hospital steamer without expense. It may be safely said that the vast field afforded by these Charities for the study of diseases at the bed-side, for witnessing every variety of operations in Surgery, together with the treatment of surgical affections, for the study of morbid anatomy, and the practice of obstetrics, is not surpassed elsewhere in this or any other country.

Ample provisions will be made for pursuing practical anatomy. Anatomical material will be supplied in abundance and with but little expense to the student.

Twenty-two resident Physicians and Surgeons are annually appointed on recommendation of the Medical Board of the Hospital, after an examination by this Board, and receive a salary sufficient for their support.

Fees for the lectures during the preliminary and regular terms, $105. Tickets for any of the departments during the regular term may be taken out separately, the fees being proportionate to the number taken.

The fee for all the lectures during the preliminary term is $10. This sum will be deducted from the fees for the whole course ($105), if tickets to the latter be taken out.

Matriculation Fee	$ 5
Graduation Fee	30
Demonstrator's Ticket	5

Payment in all cases is required, and the tickets must be taken out at the beginning of the term.

The requisites for graduation are twenty-one years of age; three years study with a regular and reputable practitioner (or practitioners), inclusive of the time of attendance at lectures; two full courses of lectures, the last in this College; proper testimonials of character; an acceptable thesis, and an examination by seven of the Professors in the several departments of instruction.

This College is endowed with all the powers and privileges belonging to any chartered Medical School in this State.

Circulars will be sent, and further information given, on application to Professor Benjamin W. McCready, Secretary, No. 7 West Ninth Street; or to Professor Isaac E. Taylor, President, No. 13 West Twentieth Street

Board and Lodging can be obtained in New York for from $3 to $5 per week.

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THE

AMERICAN JOURNAL

OF THE MEDICAL SCIENCES

FOR OCTOBER 1861.

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TO READERS AND CORRESPONDENTS.

Dr. Levick's interesting paper on Chorea was in type for this number, but has been crowded out. It shall appear in our next.

The following works have been received:—

Epileptic and other Convulsive Affections of the Nervous System, and their Pathology and Treatment. By CHARLES BLAND RADCLIFFE, M. D., F. R. C. P., &c. &c. &c. Third edition (incorporating the Gulstonian Lectures for 1860. London: John Churchill, 1861. (From the Author.)

On the Time and Manner of the Closure of the Auriculo-Ventricular Valves. By GEORGE B. HALFORD, M. D., &c. &c. London, 1861. (From the Author.)

The Pathology and Treatment of Venereal Diseases: including the Results of Recent Investigations upon the Subject. By FREEMAN J. BUMSTEAD, M. D., Lecturer on Venereal Diseases at the Coll. Phys. and Surg., New York, &c. &c. With illustrations on wood. Philadelphia: Blanchard & Lea, 1861. (From the Publishers.)

A Treatise on the Diseases of the Joints. By RICHARD BARWELL, F. R. C. S., Ass. Surg. Charing-Cross Hospital, &c. Illustrated by engravings on wood. Philadelphia: Blanchard & Lea, 1861. (From the Publishers.)

Medical Jurisprudence. By ALFRED SWAINE TAYLOR, M. D., F. R. S., &c. &c. Fifth American, from the seventh and revised London edition. Edited, with additions, by EDWARD HARTSHORNE, M. D., one of the Surgeons of the Pennsylvania Hospital. Philadelphia: Blanchard & Lea, 1861. (From the Publishers.)

Transactions of the Medical Society of the State of New York for the year 1861. Albany, 1861. (From George W. Bradford, M. D.)

Communications of the Rhode Island Medical Society for the year 1861. Published by the Society. Providence, 1861.

Proceedings of the Academy of Natural Sciences of Philadelphia, May, June, July, 1861.

Tenth Annual Meeting of the Illinois State Medical Society, held in Paris, May 8th and 9th, 1860. Chicago, 1860.

Transactions of the State Medical Society of Indiana, at its Twelfth Annual Session, held in the city of Indianapolis, May 21st and 22d, 1861. Indianapolis, 1861.

Treatment of Fractures of the Long Bones by Simple Extension. By JOHN SWINBURNE, M. D., one of the Surgeons of the Albany City Hospital. Albany, 1861. (From the Author.)

Eulogy on the late John W. Francis, M.D., LL.D.; being a Discourse on his Life and Character. By Valentine Mott, M.D., LL.D., Emeritus Professor of Surgery in the University of New York, &c. &c. Delivered before the New York Academy of Medicine, May 29th, 1861. Published by order of the Academy. New York, 1861. (From the Author.)

Address on the Epizoöty, lately prevalent among Swine. By Edwin Snow, M.D., of Providence; with the Results of Post-Mortem Examinations by G. L. Collins, M.D., of Providence. Read before the Rhode Island Medical Society at the Annual Meeting, June 19th, 1861. (From Dr. E. Snow.)

The Modus Propagandi of the Human Species Physiologically Explained. By John O'Reilly, M.D., &c. &c. New York, 1861. (From the Author.)

The Mensuration of the Human Skull. By J. Aitken Meigs, M.D., &c. Philadelphia, 1861. (From the Author.)

Historical Sketch of the Medical Department of the University of Louisiana, its Professors and Alumni, from 1835 to 1861. New Orleans, 1861.

Vesico-Vaginal Fistula. A translation of the articles published in the *Gazette Hebdomadaire*, by M. Ar. Verneuil. Reprinted from the *Boston Medical and Surgical Journal.* Boston, 1859. (From Dr. George Hayward.)

Report of the Committee of Medical Education, appointed by the Medical Society of the State of New York, February, 1859. Albany, 1861. (From Dr. Howard Townsend.)

Medical Department of the University of Louisville. Announcement for Session of 1861–62. Louisville, 1861.

Third Annual Announcement of the Medical Department of Lind University, at Chicago, Illinois, for the College Session of 1861–62. Chicago, 1861.

The following Journals have been received in exchange:—

Journal de Médecine de Bordeaux. Redacteur en chef, M. Costes. May, 1861.

Le Moniteur des Sciences Médicales et Pharmaceutics. Redacteur en chef, M. H. De Castelneau. June, July, August, 1861.

Journal de la Physiologie de l'Homme et des Animaux. Publié sous la direction du Dr. E. Brown-Sequard. October, 1860; January, 1861.

Gazette Médicale de Paris. June, July, August, 1861.

The British and Foreign Medico-Chirurgical Review. July, 1861.

The Medical Critic and Psychological Journal. Edited by Forbes Winslow, M.D. July, 1861.

The Half-Yearly Abstract of the Medical Sciences. Edited by W. H. Ranking, M.D., and C. B. Ratcliffe, M.D. January—June, 1861.

The Royal London Ophthalmic Hospital Reports and Journal of Ophthalmic Medicine and Surgery. Vol. III. No. 2.

British Medical Journal. June, July, August, 1861.

London Medical Review. July, August, 1861.

Edinburgh Medical Journal. July, August, 1861.

Medical Times and Gazette. July, August, September, 1861.

Dublin Medical Press. June, July, August, 1861.

The Retrospect of Medicine. By W. Braithwaite, M. D., and James Braithwaite, M.B. January—June, 1861.

The Glasgow Medical Journal. July, 1861.

Dublin Quarterly Journal of Medical Science. August, 1861.

The British American Journal. Edited by Archibald Hall, M. D. June, July, August, September, 1861.

The North American Medico-Chirurgical Review. Edited by S. D. Gross, M.D., T. G. Richardson, M. D., and S. W. Gross, M. D. July, September, 1861.

The Berkshire Medical Journal. Edited by Wm. Henry Thayer, M. D., and R. Cresson Stiles, M. D. July, August, September, 1861.

American Medical Times. July, August, September, 1861.

The American Journal of Insanity. Edited by the Medical Officers of the New York State Lunatic Asylum. July, 1861.

The Cincinnati Lancet and Observer. Edited by Drs. Stevens, Murphy, and Weber. July, August, September, 1861.

The Columbus Review of Medicine and Surgery. Edited by W. L. McMillen, M. D. April, 1861.

The St. Louis Medical and Surgical Journal. Edited by M. L. Linton, M.D., and W. M. McPheeters, M.D. July, September, 1861.

The Ohio Medical and Surgical Journal. Edited by John Dawson, M. D., and J. W. Hamilton, M. D. July, 1861.

Buffalo Medical and Surgical Journal and Reporter. Edited by Julius F. Miner, M. D. August, September, 1861.

The Cincinnati Medical and Surgical News. Edited by A. H. Baker, M. D., and J. A. Thatcher, M. D. June, July, 1861.

The American Journal of Science and Arts. Conducted by Profs. B. Silliman, B. Silliman, Jr., and J. D. Dana. July, September, 1861.

The Medical and Surgical Reporter. Edited by S. W. Butler, M. D., and R. J. Levis, M. D. July, August, September, 1861.

The Pacific Medical and Surgical Journal. Edited by David Wooster, M. D. May, July, 1861.

Cleveland Medical Gazette. Edited by Drs. Weber, Stevens, and Murphy. July, August, September, 1861.

The Chicago Medical Examiner. Edited by N. S. Davis, M. D., and F. W. Reilly, M. D. July, September, 1861.

The American Medical Monthly. Edited by J. H. Douglas, M. D. July, August, September, 1861.

The San Francisco Medical Press. Edited by E. S. Cooper, M. D. July, 1861.

The American Journal of Pharmacy. Published by authority of the Philadelphia College of Pharmacy. Edited by WILLIAM PROCTER, Jr., Professor of Pharmacy, &c. July, September, 1861.

American Druggists' Circular and Chemical Gazette. July, August, September, 1861.

The Druggist. July, August, 1861.

The Dental Cosmos. Edited by Drs. WHITE, MCQUILLEN, and ZIEGLER. July, August, September, 1861.

Communications intended for publication, and Books for Review, should be sent, *free of expense*, directed to ISAAC HAYS, M. D., Editor of the American Journal of the Medical Sciences, care of Messrs. Blanchard & Lea, Philadelphia. Parcels directed as above, and (carriage paid) under cover, to Messrs. Trübner & Co., Booksellers, No. 60 Paternoster Row, *London, E. C.;* or M. Hector Bossange, Lib. quai Voltaire, No. 11, *Paris*, will reach us safely and without delay. We particularly request the attention of our foreign correspondents to the above, as we are often subjected to unnecessary expense for postage and carriage.

Private communications to the Editor may be addressed to his residence, 1525 Locust Street.

ALL REMITTANCES OF MONEY, and letters on the *business* of the Journal, should be addressed *exclusively* to the publishers, Messrs. Blanchard & Lea.

☞ The advertisement-sheet belongs to the business department of the Journal, and all communications for it should be made to the publishers.

To secure insertion, all advertisements should be received by the 20th of the previous month.

TO OUR SUBSCRIBERS.

THE interruption of communication having prevented us from forwarding the "JOURNAL" to many of our subscribers who had paid in advance their subscriptions for 1861, we desire to state that we hold their numbers, together with the "MEDICAL NEWS AND LIBRARY," for future delivery or subject to their order. Those who have not paid can complete their sets for the year on the settlement of their subscriptions.

As the "JOURNAL" has heretofore aimed to be an organ of the profession of the whole country, the present condition of affairs must necessarily somewhat limit its circulation. Subscribers may nevertheless rely that there will be no diminution for the future in the efforts of the Editor and Publishers to maintain the position which it has acquired during a career of more than forty years.

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XII. A Course of Lectures on the Physiology and Pathology of the Central Nervous System. Delivered at the Royal College of Surgeons of England, in May, 1858. By C. E. Brown-Séquard, M. D., F. R. S. Philadelphia: J. B. Lippincott & Co., 1860. 454

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XIV. A Treatise on Diseases of the Joints. By Richard Barwell, F.R.C.S., Assistant Surgeon, Charing Cross Hospital, &c. Illustrated by engravings on wood. Philadelphia: Blanchard & Lea, 1861. 8vo. pp. 463, with index. 474

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XV. Transactions of State Medical Societies:—

1. Transactions of the Medical Society of the State of New York, for the year 1861. 8vo. pp. 408. Albany, 1861.
2. Transactions of the Fifteenth Annual Meeting of the Ohio State Medical Society, held at Ohio White Sulphur Springs, June 12th, 13th, and 14th, 1860. 8vo. pp. 267. Columbus, O., 1860.
3. Medical Communications, with the Proceedings of the Sixty-Ninth Annual Convention of the Connecticut Medical Society, held at New Haven, May 22d and 23d, 1861. 8vo. pp. 100. Hartford, 1861.
4. Communications of the Rhode Island Medical Society, for the year 1861. 8vo. pp. 66. Providence, 1861. 491

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XVIII. Transactions of the Obstetrical Society of London. Vol. II. For the year 1860. With a List of Officers, Fellows, etc. London, 1861. 8vo. pp. 368. 509

XIX. On Scrofulous Diseases of the External Lymphatic Glands; their Nature, Variety, and Treatment; with Remarks on the Management of Scrofulous Ulcerations, Scars, and Cicatrices. By P. C. Price, F.R.C.S.E., Surgeon to the Great Northern Hospital, the Metropolitan Infirmary for Scrofulous Children, at Margate, &c. Illustrated with engravings on wood. London: 1861. 12mo. pp. 159. 523

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2. The Physiology of Common Life. By George Henry Lewes, author of "Sea Side Studies," "Life of Goethe," etc. In two volumes. New York: D. Appleton & Co., 443 & 445 Broadway, 1860. 528
3. Studies in Animal Life. By the same author. New York: Harper & Brothers, 1860. 530

XXII. Operative Surgery adapted to the Living and Dead Subject. By C. F. Maunder, Part I. and II., complete, London, 1860–61, 12mo. pp. 318. 532

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THE

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ART. I.—*Clinical Report on the Treatment of Phthisis by the Chlorate of Potassa.* By AUSTIN FLINT, M. D., Professor of the Principles and Practice of Medicine in the Bellevue Hospital Medical College, New York, and in the Long Island College Hospital.

AT the meeting of the American Medical Association in June, 1860, the late Dr. E. J. Fountain, of Davenport, Iowa, submitted to the Section on Practical Medicine, a paper on the Treatment of Phthisis by the Chlorate of Potassa, in conjunction with Remarks on Ozone and Oxygen as Therapeutic Agents. The paper was listened to with interest, but the members of the Section declined to recommend it for publication in the *Transactions*, on the ground that, so far as the use of the chlorate of potassa in phthisis is concerned, the cases reported were few (three or four only), and the diagnosis was not based on sufficiently complete evidence afforded by physical signs. The members of the Section were unwilling that the Association should appear to sanction the introduction of a new remedy claiming to exert a special influence over phthisis, unless this claim seemed to rest on abundant facts. A resolution was, therefore, adopted referring the paper back to the author, with the request that he pursue his investigations, and report at the next meeting of the Association. This action was acceptable to Dr. Fountain, and he was earnestly engaged in pursuing further experimental researches on the effects of the chlorate of potassa, when his labours in behalf of practical medicine were suddenly arrested by his untimely death. In a conversation with him at the meeting of the Association, I promised to make the employment of this remedy in phthisis the subject of clinical observation, and to furnish him with a statement of the results. I have not been unmindful of this promise, and I propose to present in this article the facts which I have recorded, and which I should have placed at his disposal had his valuable life been spared.

After the meeting of the Association, I prescribed this remedy in several cases of phthisis at my clinic at the Long Island College Hospital. It was not convenient for me to make record of these cases, and the patients were under observation for a short period only, but the impression which I received was favourable to the utility of the remedy. On entering upon duty at the New Orleans Charity Hospital, November, 1860, I adopted the following plan: Whenever cases of phthisis were admitted into my wards, the patients were at once, or soon after admission, placed under the use of this remedy, and it was continued so long as I was satisfied that they were not losing ground. When I became satisfied that they were losing ground, the remedy, as a rule, was discontinued. While the patients were taking the chlorate of potassa, I prescribed no other remedy, excepting the syrup of morphia[1] as a palliative of cough. I excluded alcoholic stimulants when I thought I could do so with propriety, but, in some cases, I did not feel at liberty to withhold these, and they were accordingly given while the patients were taking the chlorate of potassa. In all cases the full diet of the hospital was allowed, and the patients were encouraged to be up, and to go out of doors whenever the weather and their strength permitted.

In observing the apparent effects of any remedy in patients received into hospital with phthisis, the following points are to be kept in mind. The change in certain cases will alone be sufficient for a marked improvement. This will be likely to be manifest when the comforts of a hospital are exchanged for insufficient food, miserable lodgings, and the hardships incident to drunkenness. The expectation of benefit is sometimes not without influence. On the other hand, in some cases the change is for the worse, the condition as regards diet and accommodations being inferior to that before entering the hospital; moreover, the hygienic influences of the hospital from overcrowded wards, etc., may be positively pernicious. Some persons, too, receive an unfavourable mental influence from association with the sick and dying. The characteristic mental state in phthisis, as regards sanguine hopes of recovery, leads patients to persuade themselves for a time that any remedy which they are taking is highly beneficial, and the physician must, therefore, rely upon his own observation, rather than on the patients' statements for the evidence of improvement. On the other hand, patients affected with this, as well as any other chronic malady, are apt to become tired of any remedy if continued long, and they may be led to think they are not improving by a desire for a change in treatment.

I kept records of all the cases of phthisis received into my wards (containing about forty beds) during my winter's service, extending over nearly five months. To report the cases in full, would extend this article too much, and render it needlessly tedious. I shall give a report of each case separately, but confine myself to facts sufficient to show the correctness of the diagnosis, the amount of tuberculous deposit, the existence, or otherwise, of important complications, the general condition of the patient when admitted, and the progress of the disease while the patient was under observation, with reference to the influence of the remedy under consideration. Under the head of *remarks*, appended to each case, I shall offer such statements as a reviewal of the case may suggest. Finally, under the head of *general conclusions*, I shall present a *résumé* of certain facts, together with such inferences as a survey of the apparent results in all the cases will warrant.

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[1] The syrup of morphia of the hospital contains a grain of the sulphate of morphia in an ounce of simple syrup.

Case 1. Michael Holligan, aged 50, Irishman, tanner, admitted Oct. 23, 1860.

Cough and expectoration had existed for three years. He was compelled to quit work only a month or so before his admission, but for several months he had been able to work only a portion of the day. He was accustomed to work within doors, and was much exposed to wet.

Moderate diarrhœa had existed much of the time for the preceding three years.

When admitted he was able to be up and dressed most of the day. He was considerably emaciated. The aspect was not notably morbid. He was deficient in breath on exercise. The cough was frequent and expectoration large. Appetite good. No diarrhœa. Pulse 96; respirations 20.

Physical Signs.—Flattening and diminished superior costal movement on the right side. Notable dulness on percussion between 2d and 5th rib on the right side, and well-marked cracked metal resonance. The respiration in the situation just named was broncho-cavernous, the cavernous predominating, accompanied with gurgling.

Cod-liver oil was at first prescribed, but diarrhœa occurred, and this remedy was discontinued. The bismuth was given with reference to the diarrhœa. On Nov. 3, the chlorate of potassa was prescribed, three drachms to be taken daily. Two ounces of brandy were given three times daily.

Nov. 11. The chlorate of potassa was discontinued on account of diarrhœa, and opium and tannic acid prescribed. Two days afterwards, the bismuth was substituted, and the syrup of morphia given to allay cough.

15*th.* No diarrhœa, and the chlorate of potassa was resumed in the same quantity as before, viz., three drachms daily.

Dec. 16. Under this date is the following record: "The treatment is continued. The patient appears to hold his own. If he fails, the failure is very gradual. He reports that he thinks he is better than when my service commenced. He is up and dressed all day. The diarrhœa of late has not been troublesome, but he complains of abdominal pain often. The abdomen is not tender to the touch. The expectoration is large, but he thinks has not increased. The appetite is tolerable. To-day, over the whole of the middle third of the right side of the chest, the respiration is bronchial, and accompanied with coarse mucous or cavernulous rales."

19*th.* The patient reported not so well. He complained of dyspnœa, and difficulty of expectoration. His aspect denoted failure since the date of the preceding record. The chlorate of potassa was discontinued.

24*th.* The patient had failed rapidly, and died on this date.

The lungs were removed for examination, and inadvertently lost. A uperficial examination showed advanced tuberculosis, solidification, and cavities. A large excavation, near the apex of the right lung, was opened in removing this lung from the chest.

Remarks.—This was certainly an unpromising case for the trial of any remedy. The pulmonary affection was extensive, far advanced, and probably complicated with intestinal tuberculosis. But for a month, while taking steadily three drachms of the chlorate of potassa daily, the failure was almost imperceptible. The patient kept up as long as possible, and, when obliged to take to the bed, he sank very rapidly. We see this not infrequently in cases of pulmonary tuberculosis. Viewing this case alone, it is difficult to say how much importance belongs to the use of the remedy, or whether or not it exerted any beneficial effect. It is worthy of note, that the patient was able to take the remedy without any aggravation of the diarrhœa which had existed much of the time for three years.

Case 2. Arthur Burns, aged 25, clerk, admitted May 3, 1860.

Two weeks before his admission he became affected with incomplete paralysis of the lower limbs. About the same time he began to cough. The paralysis of the limbs increased until he was unable to get about, and this led him to enter the hospital. Since his admission up to the commencement of my service (six months) he had kept the bed most of the time, but was able to walk about a little with the aid of a crutch and cane. Cough and expectoration had progressively increased since his admission.

When the record was commenced, Nov. 2, 1860, he was greatly emaciated and intensely anæmic. The appetite was poor, and the bowels occasionally loose. Pulse 96 and very small; respirations 12. He estimated the quantity of expectoration at about a pint daily. He kept the bed constantly.

Physical Signs.—Diminished superior costal movement and dulness on percussion at the summit, were marked on the left side. Over a circumscribed space as large as a dollar, the respiration was cavernous (the inspiration non-vesicular and low, and the expiration lower in pitch than the inspiration). Below this space the respiration was broncho-vesicular. The cavernous whisper was marked within the space in which the respiration was cavernous.

The chlorate of potassa was prescribed a week before the record was commenced. It was borne well, three drachms being given daily. Three ounces of brandy were given daily, and the syrup of morphia to allay cough.

The patient reported that he had greatly improved since this treatment was adopted, but his general appearance did not denote any improvement.

Nov. 18. The patient had evidently failed, but he daily reported better, and complained of nothing. The chlorate of potassa was continued with brandy and the syrup of morphia.

20th. Death occurred on this date. The patient continued to report better, and apparently died under the delusion that he was progressively improving. Diarrhœa was troublesome during the last few days of life, and the evacuations were frequently passed in bed.

On examination after death, at the apex of the left lung a cavity was found nearly as large as a small orange. Small deposits of softened tubercle existed in the neighborhood of the large cavity, but not enough to produce much consolidation. There were no collections of crude tubercle, and no cavities existed near the large excavation. At the lower part of the upper lobe were two small cavities of the size of filberts. A cavity of the size of a hickory nut existed at the posterior and inferior portion of the upper lobe of the right lung. Smaller cavities, and small collections of softened tubercle existed in this lung.

The intestines presented no morbid appearances. The bladder was contracted, the lining membrane thickened, and its surface covered with bloody mucus.

Remarks.—This case also was extremely unpromising. The chlorate of potassa given for nearly a month exerted no apparent effect to retard the progressive failure of the powers of life ending in death.

Case 3. Patrick Corley, aged 34, labourer, admitted Oct. 3, 1860.

He stated that he had had cough and expectoration for two and a half years. During this period he had received no medical treatment, and he had not quit work even for a day until he entered the hospital. He entered for dengue, which was then very prevalent. He was confined to the bed for several days with the dengue. On recovering from that affection, he found himself weak, and the cough and expectoration had increased.

When my record commenced, Nov. 5, 1860, he was up all day, and much of the time out of doors. He estimated the quantity of expectoration at half a pint daily. The aspect was pallid, but he did not appear to be much emaciated. He thought he was twenty pounds under his average weight in full health. Pulse 88; respirations 24.

Physical Signs.—Flattening at the summit of the right side of the chest, with diminished superior costal movement, and restrained elevation of the right scapula on forced breathing. Dulness on percussion at the right summit marked, the respiration broncho-vesicular, and relatively feeble.

The treatment for the month he had already been in hospital was cod-liver oil, with brandy and full diet. The cod-liver oil was discontinued Nov. 5, and three drachms of the chlorate of potassa, daily, substituted. An ounce of brandy was given three times daily, and the syrup of morphia to allay cough.

Dec. 10. The patient on this date reported that he felt well enough to leave the hospital, and undertake to work as a labourer. He stated that he had gained steadily in strength since my treatment was commenced, and that his cough and expectoration had considerably lessened. His aspect was improved, but he was still pallid. He was discharged on this date.

Remarks.—The previous history, and the physical signs in this case, show that the tuberculous deposit was of long standing, and that the affection was not progressive, but probably retrogressive. The case illustrates facts which I have repeatedly observed, viz., the cachexia may be, as it were, exhausted by a certain amount of deposit, and the disease tend intrinsically to pursue a favourable course. Although undoubtedly tuberculous for two and a half years, the patient had kept steadily at work, and the disease remained in abeyance without medical treatment. The facts illustrated by this case are to be considered in endeavouring to estimate the influence of remedies. This patient entered the hospital not for the tuberculosis, but for dengue. He was left enfeebled by the latter, and when he had recovered the condition of health in which he was at the time of being attacked with that affection, he was as able to work as he had been previously. It may fairly be doubted whether this case furnishes evidence of any positive influence of the chlorate of potassa on the tuberculous disease.

CASE 4. Daniel McFaden, aged 22, Irishman, labourer, admitted Nov. 7, 1860.

Sixteen months before his admission he had a copious hæmoptysis. After this he was well apparently for four months, when cough commenced. Afterwards he had several attacks of hæmoptysis. He continued to work until shortly before he entered the hospital, but for some time he had not been able to perform full days' labour.

At the time of his admission he was twenty-seven pounds under his average weight in health. He was able to be up all day and out of doors. His aspect was not notably morbid; the prolabia presented a good colour. The expectoration was large. The appetite was good, and the bowels constipated. Pulse 100; respirations 32.

Physical Signs.—Diminished superior costal movement on the right side, and marked dulness on percussion. In front, on this side, the respiration almost inappreciable and accompanied by subcrepitant rales; behind the respiration broncho-vesicular.

Half an ounce of the chlorate of potassa daily was prescribed, and the syrup of morphia.

Dec. 2. Under this date the following record was made: "This patient of late has daily reported an increase of cough and expectoration, and decrease of strength. He states to-day that he has lost eight pounds since he entered the hospital. He has evidently lost ground, although he is still up and about all day. Concluding, therefore, that I cannot conscientiously continue longer the chlorate of potassa treatment, I have to-day directed its discontinuance, and have prescribed half an ounce of the cod-liver oil, and an ounce and a half of brandy, three times daily."

3*d.* The patient desired to leave the hospital, and was discharged.

Remarks.—In this case the amount of tuberculous deposit was not very large, and there was no important complication. The chlorate of potassa, which, with the syrup of morphia, constituted the treatment for nearly a month, half an ounce being given daily, failed to prevent an increase of the cough and expectoration, with progressive failure of strength, and the patient was sufficiently discouraged to request a discharge from the hospital.

CASE 5. Timothy Ford, aged 45, Irishman, labourer, admitted Nov. 6, 1860.

A year before his admission he had an attack of hæmoptysis, but he had no cough, and was apparently in good health, until March or April, 1860. He continued to labour until July, and was then obliged to quit work on account of weakness.

At the time of his admission he was up all day and able to be out of doors. The quantity of expectoration was considerable. The appetite was tolerable. The bowels were constipated. Pulse 100, small and feeble; respirations 28.

Physical Signs.—Diminished superior costal movements on the right side, and notable dulness on percussion in the infra-clavicular region. The respiration in this region extremely feeble, and accompanied by mucous rales. Vocal resonance intense in this region, and feeble on the left side. Bronchial whisper more acute than on the left side. Behind, relative dulness over the right scapula; the respiration inappreciable in the upper scapular, and broncho-vesicular in the lower scapular region. Equal resonance and respiration below the scapulæ on the two sides.

Treatment.—Half an ounce of the chlorate of potassa daily, and the syrup of morphia *pro re nata.*

Nov. 20. The patient desired to leave the hospital, and was discharged on this date.

He reported on this date that for two or three days the cough and expectoration had been less than usual. His condition, however, when discharged appeared to be about the same as when admitted.

Remarks.—The chlorate of potassa given to the extent of half an ounce daily in this case for fourteen days, constituted, with the syrup of morphia, the whole medical treatment. It exerted no marked influence on the pulmonary symptoms, or the general condition.

CASE 6. Silas Worden, American, plasterer, aged 41, admitted Nov. 13, 1860.

He had good health up to July, 1860. He was then attacked with an acute affection which was called swamp fever, and confined to the bed for several weeks. He recovered sufficiently to go to work, and was then seized with the dengue. After recovering from this affection he was attacked with intermittent fever, which was arrested after three paroxysms. About eight weeks before his admission he began to cough. The cough was at first slight and the expectoration small. These symptoms increased, and he lost, progressively, strength and flesh until he was too weak to work, and came to the hospital. He had a slight hæmoptysis three weeks before his admission.

At the time of his admission he was able to be up all day and out of doors. The appetite was good and the bowels regular. He was thin but not notably emaciated. The aspect was pallid. The pulse was 100, small and feeble; the respirations, 24.

Physical Signs.—Diminished superior costal movements on the left side. Marked dulness on percussion at the left summit in front and behind; the respiration broncho-vesicular, approaching the bronchial, the voice somewhat bronchophonic, and the bronchial whisper notably intense and acute.

Treatment.—Half an ounce of the chlorate of potassa daily, and the syrup of morphia *pro re nata.*

Dec. 3. The patient had shortly prior to this date a slight hæmoptysis. The cough and expectoration were increased. He had lost in weight and was more anæmic than on the previous date.

The treatment was continued.

10*th.* The patient complained of profuse sweating at night. Treatment continued.

22*d.* The increase in the pulmonary symptoms and the loss in weight and strength were such that I did not feel warranted in continuing longer the chlorate of potassa treatment, and it was on this date discontinued. Cod-liver oil and brandy were prescribed. The patient was still able to be up all day.

Feb. 8, 1861. The patient steadily declined after the preceding date and died on this day.

On examination after death the left lung was found to contain, near the apex, a cavity as large as an English walnut, and the upper and middle lobes were solidified by tuberculous deposit. A small cavity existed at the apex of the right lung, with considerable tuberculous solidification in the upper third of this lung.

Remarks.—The chlorate of potassa treatment was commenced in this case eight weeks after the occurrence of cough denoted the deposit of tubercle. The deposit was abundant when this treatment was commenced. The treatment was continued for six weeks and then abandoned in consequence of the steady progress of the disease and with loss of strength and weight during that period.

CASE 7. Hugh Ramsey, Scotchman, aged 31, bookkeeper, admitted Nov. 19, 1860.

In January, 1860, he had measles, and had not been free from cough since that time. In the month of March, 1860, he had slight hæmoptysis, recurring two or three times. The voice had been constantly husky for five or six weeks. He had recently come to New Orleans from Winchester, Virginia.

At the time of his admission he was thirty-four pounds below his average weight in health. He had left the bed for several days. The appetite was good. No diarrhœa. Pulse 96; respirations 32. The expectoration was copious.

Physical Signs.—Moderate relative dulness on percussion at summit of left side, in front and behind; the respiration broncho-vesicular; the voice bronchophonic, and the bronchial whisper intense and acute.

Treatment.—Half an ounce of the chlorate of potassa daily, with the syrup of morphia *pro re nata.*

Nov. 29. The patient was discharged at his request, being desirous to get to some friends in Maryland. During his stay in the hospital, the cough and expectoration diminished, and his appearance denoted improvement. The voice remained the same.

Remarks.—This case was under observation for ten days only. The condition of the patient was improved, but how far the improvement was due to the chlorate of potassa, irrespective of the influence of rest and change of climate, it is difficult to say.

CASE 8. James Ryan, aged about 21, labourer, admitted Dec. 8, 1860.

Cough had existed for a year. He continued to work up to November, and was then obliged to quit work on account of weakness and want of breath. He had lost considerably in weight.

On admission he was able to be up all day and out of doors. The expectoration was pretty large. The pulse was 64; the respirations 20. He had diarrhœa, which had existed for two days only.

Physical Signs.—Diminished superior costal movements on left side, and elevation movement of left scapula on forced breathing restrained. In front, at summit of left side, the percussion sound vesiculo-tympanitic. Distinct dulness over left scapula. Vocal resonance greater at the left than at the right summit. The voice over the left scapula slightly bronchophonic.

Treatment.—The oxide of bismuth was at first prescribed for diarrhœa, and this symptom being relieved, half an ounce of the chlorate of potassa *per diem* was prescribed Nov. 10, with the syrup of morphia *pro re nata.*

Dec. 29. A slight hæmoptysis occurred. The treatment was continued.

Jan. 1, 1861. The patient having complained of late of an increase of the cough and expectoration, and reporting that he felt progressively weaker, the chlorate of potassa was suspended, and half an ounce of cod-liver oil, with an ounce of brandy, three times daily, prescribed.

9*th.* A small hæmoptysis occurred. The cod-liver oil and brandy were continued.

Feb. 11. The patient for some days had reported not so well—more cough and expectoration, and greater debility. The general appearance did not show deterioration, and he continued to be up all day and out of doors. On repeated examinations of the chest, no evidence of an increase of the deposit of tubercle was obtained.

On this date the chlorate of potassa was resumed, half an ounce daily, and the brandy continued.

March 11. The patient reported that he felt well enough to go out, and undertake to work. He was accordingly discharged. The chlorate of potassa was continued up to the date of his discharge. He stated that the cough and expectoration were, at least, one-fourth less than when he entered, and his strength about the same as at that time. The physical signs showed no increase of the deposit during his stay in hospital.

Remarks.—The chlorate of potassa was given in this case for three weeks; cod-liver oil and brandy then constituted the treatment for six weeks, and for the remaining four weeks, up to the date of his discharge, the chlorate of potassa was resumed. The improvement occurred during the latter period, and in connection with this fact the change of season is to be considered, the weather having become warm. Moreover, the ward was not as crowded as during the two former periods.

It is also to be considered that, after resuming the chlorate of potassa, the brandy was continued, which was not given during the first period. In view of these circumstances, it is difficult to judge of the agency of the chlorate of potassa in the improvement.

Case 9. John Cock, aged 33, cooper, German, admitted Dec. 17, 1860.

Cough had existed for about twenty weeks. He had lost, as he thinks, thirty pounds in weight during this period.

At the time of his admission, he was able to be up and dressed all day, but he was pallid, emaciated, and appeared to be quite feeble. The pulse was 56 and very small. The respirations were not accelerated. Appetite poor. Bowels constipated.

Physical Signs.—Deficient superior costal movement on the left side of the chest, with notable dulness on percussion, and broncho-vesicular respiration, approaching to bronchial, exaggerated bronchial whisper, and the vocal resonance and fremitus greater than on the right side.

Treatment.—Half an ounce of the chlorate of potassa daily, with syrup of morphia *pro re nata.*

Dec. 29. The cough and expectoration had somewhat diminished, but he had not improved in appetite and strength. The chlorate of potassa was continued, and an ounce of brandy, three times daily, added.

Jan. 10, 1861. The patient had declined in strength, and now kept the bed constantly. The pulse was extremely feeble. The expectoration of late had been abundant and purulent. The cavernous respiration and whisper were marked in the left infra-clavicular region, over a space covered by the pectoral extremity of Cammann's stethoscope.

The chlorate of potassa was continued, with brandy every four hours.

Death occurred January 11.

On examination after death, a large cavity was found at the upper part of the left lung, and in the vicinity crude tubercle existed in abundance. A few small collections of softened tubercle were observed. The upper lobe of the right lung was crammed with tubercles, not aggregated into masses, nor softened, and no cavities.

Remarks.—In this case the chlorate of potassa, given during the time the case was under observation (twenty-four days), did not prevent the rapid progress of the disease, and its fatal termination. During this time the tuberculous affection in the left lung eventuated in the formation of a large cavity, and a fresh deposition of a large amount of tubercle took place.

Case 10. James Burns, Swede, aged 36, labourer, admitted Jan. 2, 1861.

Cough had existed for four months. He was obliged to quit work three weeks before his admission, on account of weakness and deficiency of breath.

At the time of his admission, he was able to be up all day and out of doors. His aspect was not notably morbid. He was moderately anæmic. The pulse was 100 and small; the respirations 24. He was twenty-five pounds below his average weight in health. The appetite was good; the bowels constipated.

Physical Signs.—Depression at the summit on the right side; diminished superior costal movements on that side, with notable dulness on percussion; broncho-vesicular respiration; the vocal resonance and bronchial whisper more intense than on the right side.

Treatment.—Half an ounce of the chlorate of potassa daily, and the syrup of morphia *pro re nata.*

Jan. 17. The patient reported that the cough and expectoration were about the same as when he entered, but that he had failed as regards appetite and strength. It was apparent that he had lost ground, and on this date the chlorate of potassa was discontinued, cod-liver oil and brandy being substituted.

22*d.* Physical signs showed marked increase in the amount of tuberculous deposit, and the existence of a cavity in the upper part of the right lung.

Death occurred February 1.

On examination after death, a tuberculous cavity was found at the apex of the left lung, nearly as large as a medium sized orange. The whole of the right lung was solidified with crude tubercle. The left lung contained a cavity as large as an English walnut, and portions of the upper lobe were solidified with crude tubercle.

Remarks.—The chlorate of potassa in this case, given for fifteen days, did not prevent the rapid progress of the tuberculous affection, nor a fresh deposition of tubercle, ending in death on the twenty-ninth day after admission.

Case 11. Edward Flynn, aged 28, Irishman, labourer, admitted Dec. 25, 1860.

A copious hæmoptysis occurred a year before his admission. Two months after this, cough and expectoration became prominent symptoms, and he was obliged to quit work seven months before his admission.

At the time of his admission, he was able to be up all day and out of doors. He thought he was twenty-five or thirty pounds below his average weight in health. He presented an emaciated appearance, and was notably anæmic. The appetite was poor. The expectoration was not large. The pulse was 120, and quite small; the respirations 36.

Physical Signs.—Notable depression at the right summit, and dulness on percussion; a feeble broncho-vesicular respiration in front, accompanied by subcrepitant rale; behind, in lower scapular region, the respiration nearly bronchial; the vocal resonance intense in front.

Treatment.—Half an ounce of the chlorate of potassa daily, and syrup of morphia *pro re nata.* An ounce of brandy three times daily was also given.

Jan. 21. The patient was discharged at his request. The cough and expectoration had increased since his admission, and he had failed as regards strength. His general appearance was worse, and I have noted, in connection with the history of the case, that had he remained in hospital I should have discontinued the chlorate of potassa at the date of his discharge.

Remarks.—The chlorate of potassa, given in this case for nearly four weeks, failed to produce any improvement.

Case 12. Gottleib Knaonar, German, butcher, aged 42, admitted Dec. 25, 1860.

Cough and expectoration had existed for thirteen months. Hæmoptysis had occurred. In other respects the previous history was imperfectly obtained.

At the time of his admission he kept the bed, and complained much of pain in the right side. I insisted upon his getting up, and in a short time he remained up all day, and was soon able to act as an assistant to the ward nurse. The pulse was 112; respirations 32. The expectoration was small. The aspect was not notably morbid. The appetite was good.

Physical Signs.—Dulness on percussion marked in the right infra-clavicular and lower scapular regions; broncho-vesicular respiration approximating to the bronchial in these regions, and bronchophony.

Treatment.—Chlorate of potassa, half an ounce daily, was prescribed Jan. 1, 1861, and an ounce of brandy three times daily.

Jan. 28. The following is the record under this date: "On this day the chlorate of potassa is discontinued and cod-liver oil, half an ounce three times daily, substituted, the brandy being continued. The patient for some time has complained of an increase of the cough and expectoration, and of loss of strength. He is evidently not improving, if he be not losing ground. He states that he has formerly been benefited by the cod-liver oil. Under these circumstances, having concluded that I have given the chlorate of potassa a fair trial, I have changed the treatment."

Feb. 17. The patient reported better, and appeared to have improved since the foregoing date. The cough and expectoration had diminished, and he had more strength. The cod-liver oil and brandy were continued.

28th. The improvement was marked, and the patient had undertaken to discharge the duties of nurse in another ward.

Remarks.—The chlorate of potassa in this case, continued for twenty-eight days, produced no improvement. Subsequently, improvement was marked under the use of cod-liver oil. To the history of this case I have appended, in my hospital book, the following note: "The improvement in this case, it is to be considered, has been since the warm weather enabled patients to be out of doors, and secured for the wards free ventilation, the hospital, moreover, being less crowded."

Case 13. Nelson Rasford, American, calker and carpenter, aged 37, admitted Dec. 26, 1860.

Cough had existed for five months. Hæmoptysis occurred a month before his admission. He had not worked for five months, and had been in a hospital at Smithland, Ky., for three months.

At the time of his admission he was able to be up all day and out of doors. He was thirty pounds under his average weight in health. The expectoration was abundant. He had diarrhœa, which had existed for a fortnight.

Physical Signs.—Dulness on percussion at the summit of the right side, in front and behind; the respiration broncho-vesicular; the bronchial whisper notably louder and more acute than on the left side, and the vocal resonance intense, but no bronchophony.

Treatment.—The oxide of bismuth was given for three days, with reference to the diarrhœa, which then ceased.

Dec. 30. Half an ounce of the chlorate of potassa daily was prescribed, and half an ounce of brandy three times *per diem*, with syrup of morphia *pro re nata.*

Jan. 19, 1861. The patient desired to leave the hospital, and was discharged. He proposed to try to do some light work. During his stay in hospital he had two attacks of hæmoptysis, the quantity of blood raised with each attack being small.

As regards his condition when discharged in comparison with his condition when he entered, the expectoration was about the same in amount, and he appeared to have neither lost nor gained in strength.

Remarks.—There was certainly no improvement in this case during the twenty days that the chlorate of potassa treatment was pursued.

Case 14. Michael Murray, aged 27, hostler, admitted Dec. 3, 1860.

Cough had existed for three months. During this time he had lost moderately in weight, and considerably in strength.

At the time of his admission he was pallid and quite weak, but was able to be up all day and out of doors.

Physical Signs.—Distinct dulness on percussion at the summit of the left side of the chest, in front and behind; broncho-vesicular respiration; the bronchial whisper more intense as well as more acute than on the right side, and the vocal resonance slightly greater than on the right side.

Treatment.—Half an ounce of the chlorate of potassa daily.

Feb. 3, 1861. On this date the patient reported well enough to leave the hospital, and was discharged. The improvement had been progressive and was marked. The cough and expectoration were diminished one-half. He appeared to have gained in weight. He was less pallid. The appetite and digestion were good. The physical signs were the same when discharged as when he was admitted.

Remarks.—The chlorate of potassa in this case was given for two months, and was the only remedy given. Under this treatment there was no evidence of progress of the tuberculous affection, and the improvement in all respects was striking, the patient recovering sufficient strength to feel able to return to labour.

General Conclusions.—It will not be questioned that the value of this or any remedy, in the treatment of this or any disease, is to be determined by experience. The only questions are, what are the conclusions to be drawn from experience, and how are they to be obtained? If the treatment of cases of phthisis by the chlorate of potassa be followed by recovery, or improvement, not attributable to other agencies, nor to the intrinsic tendencies of the disease, this remedy has a certain value. The degree of value is according to the ratio of cases in which it exerts a remedial influence, the proportion of instances in which it conduces to recovery, and the amount of improvement due to it when patients do not recover. Collections of cases in which the treatment consisted chiefly, or exclusively, in the employment of this remedy, contain the data for determining its value. A few cases are not sufficient, for it is certain that phthisis does not always tend intrinsically to a fatal result, but in some instances ends spontaneously in recovery. I have sufficient evidence of the correctness of this statement. Moreover, not very infrequently patients affected with phthisis remain for a long period in a condition nearly or quite stationary, the affection not progressing, and no fresh deposition of tubercle taking place, when this condition is not dependent on the influence of any remedy. I have records of cases which warrant this statement. In determining the value of this, or any remedy, therefore, the number of cases collected must be sufficient to make fair allowance for the facts just stated.

The cases should be recorded. To carry in the mind all the important facts, in a series of cases, having reference to the value of a remedial agent, is simply an impossibility. I do not mean to be understood as saying that the conclusions drawn from unrecorded experience are worthless. They are entitled to more or less weight, according to the estimate which we may place on the mental capacity and candour of those who communicate them, and the confidence which we may feel in our own faculties when the conclusions are our own. Therapeutical doctrines have always been, and must for a long period to come continue to be, to a greater or less extent, based on this kind of experience, when they are not purely theoretical, because the results of a better experience are acquired very slowly. This better experience consists in the deductions legitimately drawn from carefully recorded cases. In this way only can facts be accumulated in sufficient number for analytical investigation, and in this way only are the errors arising from preconvictions and hasty generalizations to be avoided.

The fourteen cases of phthisis now reported, were all that came under observation in my wards in the Charity Hospital during my last winter's service. I recorded these cases with express reference to the study of the influence of the chlorate of potassa on the disease, and, as already stated, I had previously been led to entertain the expectation that this remedy would be found to be valuable, from the cases reported by the late Dr. Fountain, and from having prescribed it in a few cases which were not recorded. In each of these fourteen cases the physical signs and symptoms afforded ample evidence of the existence of the disease. In five of the cases the disease proved fatal in the hospital, and the correctness of the diagnosis was confirmed by examinations after death.

The tuberculous disease had existed for some time in all the cases, and in most of the cases for a considerable period. This is a point to be considered. The question may fairly be raised, whether the results might not have been different in a series of cases in which the remedy was earlier employed. The facts with regard to the duration of the disease before the patients came under my observation are as follows: In one case it had existed over 3 years; in one case over 2 years; in three cases 1 year or over; in four cases 6 months or over; in two cases 5 months; in one case 3 months, and in two cases 2 months. In one of the two cases in which the disease had existed for only two months, the remedy was continued for six weeks without improvement, and then discontinued. This case ended fatally three months after the date of admission.

The quantity of tuberculous deposit is another point to be considered. In one of the cases only was the amount small. It was abundant in all the remainder, and in several cases it was large. The quantity of deposit may be considered as a criterion of the intensity of the cachexia, and in proportion to the quantity is the damage which the lungs sustain and the difficulty of recovery. It is therefore reasonable that in a series of cases in which a small deposit existed a remedy might be found to be efficient, which would be incompetent to effect a cure when the deposit is large.

Complications are of importance. For example, a coexisting tuberculous affection of the intestines diminishes the chances of recovery or improvement. This complication existed in one of the fatal cases. In another fatal case the patient had incomplete paraplegia and cystitis. In the other cases no important complications existed.

The condition of patients with this disease as regards muscular strength, is important with reference to the prospect of recovery or improvement. These cases differed in this regard, but in all the cases save one, the patients, when they came under my charge, were able to be up, either the whole or the greater part of the day, and to go out of doors.

The chlorate of potassa was given in most of the cases for several weeks. To be more precise, it was given for about a month in 6 cases; for two months in 1 case; for seven weeks in 1 case; for six weeks in 1 case; for twenty-four days in 1 case; for three weeks in 1 case; for two weeks in 1 case, and in one case for only ten days. The quantity given in the three first cases was three drachms, and in all the remaining cases half an ounce daily. A fresh solution was prepared each day and drank during the day. In all the cases the remedy was borne without inconvenience. It did not occasion diarrhœa nor any other unpleasant symptoms, and the patients did not seem to acquire a repugnance to it. In all the cases, while the treatment by this remedy was continued, other medicines were not given excepting the syrup of morphia as a palliative for cough, and in seven of the cases a small quantity of brandy.

Now, surveying these cases, what general conclusions are to be drawn respecting the influence of the remedy on the disease? In *nine* of the fourteen cases there are no grounds for supposing that the remedy exerted any salutary influence. In six of these nine cases the disease steadily advanced to a fatal issue, the patients dying in hospital. The histories of most of the fatal cases show that the remedy did not prevent the progress of softening, the formation of cavities, nor the fresh deposition of tubercle.

In *five* cases, a comparison of the condition of the patients before and after the use of the remedy, affords grounds for the supposition that the remedy may have exerted a salutary influence on the disease. These cases are Nos. 1, 3, 7, 8, 14. Reverting to these cases severally, in Case No. 1 the patient for a month, while taking the remedy, appeared to hold his own. He began, however, to fail rapidly while taking the remedy, so that it was discontinued five days before death. The evidence of the value of the remedy afforded by this case is certainly not strong.

In Case No. 3 the tuberculous disease had been of long standing, and was probably not progressive when the patient was admitted. He entered the hospital with dengue, and recovered from this affection with the tuberculous disease as it was previously. This case certainly affords no positive evidence of any influence exerted by the remedy on the tuberculous disease.

Case No. 7 was under observation only for ten days. The patient entered just after journeying from Virginia to New Orleans. He improved during his brief stay in the hospital, but there is at least as much ground for supposing that the improvement was due to rest and the change of climate as to the chlorate of potassa.

In Case No. 8 the chlorate of potassa was given for three weeks, and then discontinued in consequence of the want of evidence of improvement. Subsequently the remedy was resumed and continued for three weeks, and during this period the improvement was marked. In the mean time, however, the weather had become mild, and the sanitary condition of the hospital was improved by fewer inmates and freer ventilation. These circumstances render it doubtful whether much, if any, influence was exerted by the remedy.

In Case No. 14 improvement was more marked than in any of the other cases. This was the only case in which the quantity of tuberculous deposit was small. The disease had existed for three months only. The chlorate of potassa was the only remedy given in this case, and it was given during the whole time the patient was in hospital, viz., two months. The only question in this case is, whether the improvement was due to the intrinsic tendency of the disease, together with the sanitary influences of the hospital and season, or whether it was attributable, in part or exclusively, to the remedy.

In view of the facts presented in this report, the following conclusions are submitted:—

1. Of fourteen recorded cases of phthisis in which the chlorate of potassa was given in sufficient doses (℥ss *per diem* in eleven, and ʒiij *per diem* in three cases), and for a sufficient period to test its remedial power, in nine the histories afford no evidence of any salutary influence from the remedy; in four cases the circumstances render it doubtful whether much, if any, influence was fairly attributable to the remedy, and in one case only is there room for the supposition that the remedy was highly beneficial. These cases, therefore, fail to furnish proof of any special efficacy in this remedy to arrest or retard the progress of the disease.

2. Inasmuch as in all these cases, save one, the quantity of tuberculous deposit was large or abundant, and in nearly all the disease had existed for a considerable period, it remains to be ascertained by further clinical researches whether different results may not be obtained by the use of the remedy in a series of cases in which the quantity of deposit is small and the previous duration of the disease short. In collecting such cases, accuracy of diagnosis is, of course, essential, and this can only be secured by the evidence afforded by physical signs in conjunction with the previous history and present symptoms.[1] It may be added, in arriving at the conclusion that this remedy possesses no special influence in phthisis, it does not follow that it is not in a certain number of cases useful. By a special influence is meant a power to control, to a greater or less extent, the pathological processes which belong to this disease; a remedy may fail to do this, and yet be beneficial, as are a diversity of tonic remedies in cases of phthisis.

3. The chlorate of potassa may be given in cases of phthisis to the extent of half an ounce *per diem*, with entire impunity, and without occasioning any unpleasant symptoms. It does not produce diarrhœa, and may be well borne when diarrhœa is present in cases of phthisis.

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[1] Case No. 6 is an instance, already referred to, in which the remedy was commenced two months after the commencement of the disease, and continued without improvement for six weeks.

Art. II.—*Gunshot Wound of Arm; Amputation at the Shoulder-Joint. Severe Effects to Operator from Inoculation with Matter from Wound.*

By B. J. D. Irwin, M. D., Assistant Surgeon United States Army.

James Nelson, æt. 21, American, tall and well developed, with a healthy, robust constitution, received a severe gunshot wound early in the morning of March 4, 1861, while defending a house against a party of fifty or sixty Indians, who had surrounded it, and were endeavouring to destroy its four inmates by the medium of fire, which they had communicated to the building. He had been shot from a distance of fifteen or twenty yards, with a large bullet, which entered the flesh about one inch above the left nipple, and, impinging on the rib, glanced outward and backward, beneath the pectoral muscles, through a space of about four inches, after which it encountered the arm on its inner side, and passed through it, parallel to its original course, shattering the humerus at its upper third. The casual arrival at noon of myself and a brother officer, at the place, afforded means of succouring the party from their trying position. A hurried examination revealed the fact that considerable hemorrhage had taken place during the nine hours elapsed since the reception of the lesion, producing much depression, which was increased by the terrible prospect of impending death of a horrible character, which constantly presented itself for several hours. The limb I found already greatly swollen from sanguineous extravasation. After ordering cold water-dressing, to be applied to the wound, and making arrangements to have him taken to the military hospital, I left to accompany a detachment of troops, and did not again see him until the morning of the 6th. His arm and shoulder were then so much tumefied, that I found it impossible to discover the extent of the injury inflicted. Cooling lotions of cold water, containing chlorohydrate of ammonia dissolved therein, were constantly applied to the wounds, and half-grain doses of sulphate of morphia administered, whenever severe pain or restlessness indicated its use. On the 9th, suppuration having commenced, linseed-meal epithems were substituted for the water-dressing, and the wound kept clean with dilute liquor sodæ chlorinatæ. Next morning some symptoms of pleuritic inflammation were evinced over the anterior portion of the thorax. Six cut cups were applied, and an expectorant mixture containing one grain of antimonii tart. in four ounces, of which he was ordered a teaspoonful every hour, and which removed all symptoms by the following day. During the succeeding three days his condition showed no unusual symptoms. The discharge was profuse and fetid; the pus being mixed with large quantities of decomposed blood.

14*th.* The swelling having been reduced somewhat, I was enabled to examine the wound, and found the humerus splintered into numerous fragments through about four inches of its shaft. It was evident that it would be impossible to save the arm; and any attempt to do so would be fraught with the most imminent danger, as the patient would most undoubtedly succumb to the prostrating effects of such an injury so soon as the malarial poison, ever present at this place, could wreak its baneful influence by producing diarrhœa, or its more fatal congener, dysentery.

After I represented the true condition of his case to the patient, he requested to have the limb removed, while he was yet in condition to bear up against the operation. At this time wine and generous nourishing diet were allowed him, and his condition promised a favourable termination.

16*th*. After inducing anæsthesia, by a mixture of equal quantities of sulphuric ether and chloroform, I amputated the limb at the shoulder-joint, making an external and internal flap. Some momentary difficulty occurred in disarticulating the head of the bone from the glenoid cavity, consequent upon the shortness of the upper fragment, which prevented the limb being used as a lever to assist in throwing the bone from its socket. A large quantity of fetid pus, mixed with grumous blood in a putrid condition, was found infiltrated throughout the tissues surrounding the joint and in the axilla. Only four vessels required ligation. The wound was brought together, and retained in apposition by interrupted sutures and strips of isinglass plaster, and cold water-dressing applied. Half a grain of morph. sulph. was given, and wine and brandy allowed *pro re nata*.

19*th*. Dressing removed; wound looks healthy; suppurating freely.

20*th*. Wound is united along the edges; patient doing well.

22*d*. Yesterday three ligatures came away, and to-day that from the axillary artery.

25*th*. Union by first intention has taken place throughout the wound, save at the angles, from whence a small amount of pus is discharging. ℞.—Infus. cinchonæ, ℥ss, ter in die.

26*th*. Had a severe attack of intermittent fever. ℞.—Mass. pil. hyd. gr. x. Fiat in pil. no. ij, to be followed by tinct. rhei f℥j; sulph. quiniæ gr. x, at bedtime.

27*th*. Wound looks very well, and is almost entirely healed. Repeated the quinia.

31*st*. Has continued improving until to-day, when he had another attack of intermittent fever, having its different stages well marked. Some tenderness over the liver and spleen. Repeated the blue mass and quinia.

April 2. No return of fever; is rapidly convalescing; able to walk about and take gentle exercise. ℞.—Infus. cinchonæ f℥j, three times daily, an hour before eating, and tinct. ferri chloridi gtt. xxx, morning and evening.

7*th*. Wound entirely united, save at two small points. Stump looks well. Is able to take exercise out of doors, and feels in excellent spirits. Complains of loss of appetite in the morning. Tinct. gentianeæ f℥ij, ter in die, substituted for the infusion of cinchona.

8th. While walking about at some distance from the hospital, was attacked with a severe chill, accompanied with abdominal pain, which was then attributed to his having eaten heartily of pork and beans; this pain was relieved by a sinapism applied to the abdomen, and the administration of tinct. opii gtt. xxx. The paroxysmal fever left him at six o'clock P. M., at which time he was again comfortable.

About 4 o'clock A. M. next morning, I was awakened by the hospital steward, who stated that the patient was taken suddenly very ill. I found him cold and almost pulseless, and tormented with constant retching and hiccup. Sinapisms were applied over the stomach, and to the legs and feet, and cyanide of potassium was given, but immediately rejected by the stomach; some warm wine was also given, but with similar results, ℞.—Ammon. carb. gr. v; spts. ammon. aromat. gtt. xx; spts. vini gallici, aquæ, āā f℥j. M. To be repeated every ten minutes. The patient was entirely sensible, but suffering much from the idea of approaching death. The vomiting ceased for a time, but despite every effort he continued to sink, and died at 5.40 A. M.

Post-mortem, six hours after death.—Rigor mortis well marked. Profuse hypostatic congestion. Abdomen slightly tumid and tympanitic. Suspecting purulent absorption, or phlebitic inflammation of the portal or hepatic veins, I had the abdominal cavity first laid open. The first incision therein gave free exit to a quantity of highly fetid gas, followed by serum profusely mixed with flcaks of coagulable lymph. About two pints of this fluid were found within the peritoneal sac. The great omentum was engorged with dark blood, which gave it the appearance of incipient gangrene. The peritoneal coat of the liver and intestines presented a brownish-black colour, smeared over with purulent lymph, and softened very much, bearing a close resemblance to those parts when disorganized by protracted chronic dysenteric inflammation. The substance of the liver presented a healthy texture.

Owing to the almost fatal consequence that resulted to myself from inoculation with some of the matter from his wound on the day I performed the operation, I was deterred from having the examination carried any further. The results were so serious that, taken in connection with the foregoing case, I deem them sufficiently interesting to record.

On the morning of the 15th of March, I accidentally pricked the end of my left index finger, on its palmar surface, with a small point of oak splinter, not larger than the point of a common pin, which scratched away a small portion of the epidermis. It caused no more molestation than a momentary pang, so that I overlooked its presence the next day when operating on the patient, Nelson. During the ensuing evening, while making an anatomical preparation of the amputated limb, I perceived a peculiar numbness in the injured finger, while manipulating therewith, but, attributing it to fatigue, I gave it little or no attention then, and retired to rest at a late hour. I awoke some hours afterwards, suffering very much with a throbbing pain in it. In the morning, I found the whole finger red and swollen, and the lymphatics of the forearm and arm in the same condition up to the axilla. I applied cold water to the limb for some time, but finding the pain and inflammation increasing, I began to suspect that I was poisoned by absorption of some of the putrid matter while performing the operation before cited. By evening, I was bordering on wild delirium caused by the agonizing pain which I was enduring. The rapidity and virulence with which the poison acted, resembled very much that of the rattlesnake; so much so, that I feared it would affect me fatally when the rapidly progressing inflammation should reach the body. I immediately commenced taking large doses of bromine in combination with iodide of potassium, frequently repeated. Rest or sleep was impossible, and opiates made my sufferings worse, by producing disagreeable hallucinatory ideas. Next day, the finger was tensely swollen, infiltrated with fluid, with three or four large phlyctæna, giving it the appearance of gangrenous inflammation. The irritability was such that I could not touch it without producing intense suffering, so that it was impossible for myself to incise the parts requiring it. Cold water alone afforded me any relief. A violent attack of intermittent fever, with a protracted cold stage increased my wretchedness. I took of blue mass and quinia each ten grains. The following day, my friend; Dr. C. B. Hughs, arrived from Tuczon, and freely incised the finger, which lessened the pain somewhat. I now commenced taking chlorate of potassa in connection with the bromine. A repetition of the intermittent paroxysm produced so much prostration, that it was deemed proper to allow me some stimuli, consisting of wine, spirits of ammonia, and beef tea. The suffering from loss of sleep was intense and unrelieved from the commencement of the malady until the evening of the fifth day. A system of constant irrigation with cold chlorinated water induced the most fortunate results, by checking the tendency to suppuration, and I had the gratifying pleasure to see the inflammatory process reduced down to the finger alone on the sixth day. There the results were severe, ending in sphacelus, which destroyed much muscular tissue and the first metacarpal phalanx. At this date, forty-six days subsequent to the injury, a slough, including the tendinous expansion around the end of the necrosed bone, has not separated. Partial anchylosis of the second joint has resulted, and it is probable that the condition of the first phalanx is irremediable by any other than surgical means.

Fort Buchanan, Arizona, May, 1861.

Art. III.—*Experimental Researches on Points connected with the Action of the Heart and with Respiration.* By Austin Flint, Jr., M. D., Prof. of Physiology and Microscopic Anatomy in the Bellevue Hospital Medical College, New York. (With three wood-cuts.)

It is not intended in this paper to take up all points connected with either of the functions which will come under consideration. This, of course, would be inconsistent with its scope; for many are so demonstrable, and now so well established, that their consideration here would be a mere recapitulation of facts well known, and universally admitted. It is rather the object of the writer to present some original experiments, by which he hopes to elucidate points which are yet the subject of dispute among physiologists; and which, in his opinion, cannot be settled by argument alone, but are capable of being brought under direct observation, and if established, can be made subjects of actual demonstration. Some functions cannot, as yet, be disclosed to our senses in their natural operation; but there are others, among which are the questions herein to be considered, which require only correct description to serve as immutable facts, from which each inquirer may make his own deductions. For the understanding of those processes which can easily be described, and about which there can be no mistake, nothing is usually necessary but simple observation; but there are others, more delicate and obscure, which different experimenters see in different ways. In investigations into their phenomena we should strive to perfect our modes of observation, to devise means by which all confusing circumstances may be removed, to invent instruments which will make them more prominent, so that any observer, willing to take the trouble to look for himself, can see and interpret them in but one way. This is no less a desideratum in physiological than in pathological investigations; and we must seek means of physical exploration which will be to the physiologist what the stethoscope, the speculum, the ophthalmoscope, and our numerous modern exploring instruments are to the pathologist. Obstetricians might differ with regard to conditions of the os uteri, exploring only by the touch, when the speculum, exposing the parts to the eye, would leave no room for discussion: auscultators, listening with the naked ear, through the clothing of a patient, would dispute about sounds heard within the thorax, when they would agree if a stethoscope were applied to the naked chest. Thus, perfected apparatus enables the chemist and physiologist to demonstrate facts which would be obscure with less certain means of investigation. Many points in the physiology of the heart and of respiration are yet undecided; and it is by removing some sources of self-deception in the simple observation of phenomena, and by multiplying demonstrable facts, the only true bases of general deductions, that I have endeavoured to go a step beyond what is already known and established.

The questions which I shall take up in this essay are, with reference to the heart:—

First: *Does the organ shorten or elongate during its ventricular systole or contraction?*

Second: *How far can we determine the cause of its regular and periodic action?*

Third: *What are some of the causes of arrest of the action of the heart?*

Fourth: *What is the mechanism of some of the nervous influences over the action of the heart?*

Fifth: *What is the mechanism of the action of the valves which guard the orifices of the heart?*

And, in regard to respiration: *What is the cause, and where is the seat of the impression, or "besoin de respirer," which is conveyed to the respiratory centre, and which excites movements in the various muscles of respiration?*

These have either never been fully understood and described by physiologists, or are now explained in a contradictory manner in the various systematic physiological works.

It was with the hope of contributing something to the farther elucidation of these obscure and disputed points that the experiments which form the basis of this paper have been undertaken.

Changes in Consistence, Position, and Form of the Heart, during its Action.—With regard to the physiological action of the heart, there is manifestly but one correct mode of study, and that is the one which led the immortal Harvey, one of the most conscientious observers science has ever known, to make his great discovery of the circulation of the blood. That is, to expose the heart in living animals during its action, and observe its movements. This may be done in various animals, and in various ways. It is easy to observe the heart in action in the cold-blooded animals, by simply removing the anterior walls of the thorax; as its contractions will continue for a long time after such an operation, and even after the organ has been entirely separated from the body. Such observations give us a great deal of information, but are made more valuable when we compare them with phenomena observed in warm-blooded animals, in which the heart resembles the corresponding organ in man. In operating upon the heart of these animals, such as dogs, cats, sheep, horses, etc., it is necessary to keep up artificial respiration, as this function cannot, of course, be performed by the animal after the thorax has been opened. Here it is convenient, as well as humane, to abolish sensibility by some means which will not interfere with the heart's action. This may be done by crushing the medulla oblongata, in such a way as to avoid hemorrhage, as is done by Erichsen and Pavy, of London; by stunning the animal with a blow upon the head, as was done by Drs. Pennock and Moore, of our own country; by decapitation, and ligature of the vessels of the neck, as was done by Legallois; by inoculation of woorara, or by the administration of ether or chloroform, which are the most convenient modes, and now most commonly employed by physiologists. The experiments which I have made have been performed upon animals rendered insensible by woorara or ether; and I have been accustomed to operate in the following way.

The animal (generally a good sized dog) is first poisoned with woorara, by injecting about a grain of this substance into the subcutaneous areolar tissue, or completely etherized. If poisoned with woorara, its effects are watched, and in from ten to thirty minutes the dog comes under its influence; more readily, if he be made to move about. If ether be used, he is rendered insensible in the ordinary way. The trachea is then opened, and the nozzle of an ordinary bellows introduced for the purpose of keeping up artificial respiration. An incision is then made in the median line from the top of the sternum to a point somewhat below the ensiform cartilage, through the skin, fascia, and fat. The next step is to cut through the superficial muscles the whole length of the sternum on each side, about an inch from the median line, down to the costal cartilages, and we may then tear away the muscles from the chest, exposing the ribs, without much hemorrhage. The next step, after having exposed the chest in this manner, is to saw through the sternum in the median line, opening into the thoracic cavity. We can then hold open the chest by sticks, or, what is more convenient, cut across the ribs on each side with a pair of strong cutting pliers, fold back the anterior walls of the thorax, and retain them in that position by a strong ligature passed under the back of the animal, and firmly tied. In this way we expose the lungs, which are regularly inflated by the bellows, and between them, the heart inclosed in its pericardium. The pericardium may then be removed by slitting it up, and cutting it away from its attachments at the base of the heart, and we can observe this organ in the natural performance of its functions.

When the heart of a dog is exposed in this way, one of the most constant effects is an increase in the rapidity of its contractions. The pulse of a dog is always irregular in a state of health, varying from 100 to 120 beats in the minute. When the heart is exposed, its pulsations become more frequent, sometimes numbering 200 to 250.

The phenomena which we observe in connection with the contraction of the ventricles, are:—

1st. *Hardening.*—This we would expect from the structure of the heart; for we know that it is a phenomenon constantly attending muscular contraction. It was described by Harvey, who proved that it took place during contraction of the ventricles, by introducing a small canula through the walls of the left ventricle, applying the hand to the heart, and noticing that the hardening took place when a jet of blood was forced through the canula. I believe that all physiological authors agree on this point, though Dr. Wood, late of the University of Pennsylvania, does, or, at least, did hold the opinion that the heart hardened during the diastole. I have repeatedly verified the fact that the heart hardens during the systole, by repeating the experiment of Harvey. One who examines the heart in action cannot be mistaken in regard to this point.

2d. *Tilting upwards of the point of the Heart, and Locomotion of the Apex from left to right.*—About this point there is no difference of opinion. It can easily be observed in vivisections, and this movement would be expected from the spiral and *oblique* course of the superficial fibres of the heart from right to left, arising at the base, and inserted, as it were, into the apex, which is free.

3d. *Twisting from left to right.*—This can be observed by examining the apex of the heart. It is universally admitted by physiologists, and is explained by the spiral course of the fibres from right to left. This phenomenon, like the preceding, I have repeatedly observed.

4th. *Elongation of the Ventricles.*—This, which I hope to convince the reader to be a fact, is denied by all modern French, English, and German physiologists, who seem all to agree that Harvey was wrong in this part of his description of the action of the heart. Harvey, Vesalius, Riolan, Fontana, Barelli, Winslow, and Queye, contended for the elongation of the organ during its systole; but this view was combated by Steno, Lancisi, Bassuel, and, finally, by the great Haller, who has exercised more influence over physiological literature, perhaps, than any man before or since his time. It seems to me that the prevalence of the opinion, at the present day, that the heart shortens during systole can be attributed, in great measure, to the weight of the opinion of Haller. I am fortunate in having an opportunity of referring to an edition of his original works, published in Latin in 1757, and could not but be struck with its similarity in views, in arguments, and sometimes even in actual mode of expression, when treating of the change in the length of the heart during the systole, with the works on physiology which are now used as text-books, especially those by French authors. Thus it is that scientific opinions are left by such men as legacies to future generations; and are copied from one work to another, true or false, as the case may be. For, in making books, authors have but little time to investigate for themselves, even in points so easily observed as the one under consideration.

Haller bases his views upon his own experiments—upon a case of ectropy of the heart ("Denique in puero, cui cor extra pectus propendebat, *cor in diastole longius, et in systole brevius factum est, perinde ut in bestiis videmus*"[1]) and upon an argument of Bassuel. This last argument against the elongation of the heart is employed by many physiologists of the present day; though it need hardly be said that all arguments are powerless against a fact which can be satisfactorily demonstrated. Haller, after stating the views and arguments of Vesalius, Riolan, and others, says:—

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[1] Elementa Physiologiæ, tom. i. p. 392.

> "*Varia nuperrimi scriptores reposuerunt. Et quidem Cl. Bassuel ad argumentum a valvulis venosis repetitum respondit, earum fabricam contra adversarios facere. Si enim in systole cordis mucro a basi recideret, tunc certe sequeretur, ut adtractis ad apicem funiculis, valvulæ in cordis caveam deductæ ostium aperirent, sanguinique venoso eam viam referarent, quam utique clausam esse oportet, dum cor contrahitur Mihi vero videtur, valvulas quidem venosas eo tempore a sanguine versus aures repulso extrorsum, inque aurium cavitates cessuras, nisi a musculis suis papillaribus, eo ipso tempore se decurtantibus, retinerentur, inque ventriculum reducerentur.*
>
> *Aliud experimentum addidit Cl. Bassuel; cor nempe aqua replevit, viditque, dum brevius fiebat, aquam expelli.*"[1]

I have exposed thus fully the views of Haller on this subject, because of the commanding influence he so long exercised in the physiological world, and especially because, on this point, late authors seem to have followed him so closely. In addition, it may not be uninteresting to cite a few of the authorities which favour the shortening of the heart during its systole, to show how generally received is the view which I expect to disprove.

TODD, in the article on the heart in the *Cyclopedia of Anatomy and Physiology*, speaking of the organ during its systole, says: "In all warm-blooded animals, at least, it becomes shortened."

CARPENTER, in the *Principles of Human Physiology*, London, 1855, page 226, says:—

> "During their contraction, the form of the ventricles undergoes a very marked change, *the apex of the heart being drawn up towards its base*, and its whole shape becoming much more globular."

KIRKES, *Handbook of Physiology*, in speaking of the action of the ventricles, says:—

> "They contract much more slowly than the auricles, and simultaneously in every part, the whole wall of each ventricle being drawn up uniformly towards the origin of the artery at its base, diminishing the cavity in every diameter, *but especially in length, so that the heart assumes a shorter and more globular form than it had in the relaxed and distended state of the ventricles.*"

Among the French authors we find in BÉCLARD, *Traité de Physiologie*, Paris, 1856:—

> "Le Raccourissement général de l'organe, au moment de la contraction des oreillettes, est assez limité. *Son plus grand raccourssement coincide avec la contraction des ventricles*, qui l'emporte par dimensions les oreillettes" * * * "chez quelques animaux, le raccourissement suivant la verticale est moins prononcé que le raccourissement sur l'horizontale, ce qui a fait penser faussement à quelques observateurs que le cœur s'allonge pendant la systole ventriculaire."

RICHERAND, *Eléments de Physiologie*, tome i. p. 478, says:—

> "D'après cela, il est evident que le cœur se raccourcit," meaning during the systole.

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[1] Elementa Physiologiæ, tome i. p. 391.

BÉRAUD, *Eléments de Physiologie*, Revus par Ch. Robin, tome ii. page 277, says, speaking of the systole:—

> "Le sommet des ventricles se rapproche de la base et du sommet, il suit de lá que la cœur se raccourcit."

MAJENDIE, *Précis Elementaire de Physiologie*, tome ii. p. 395, says:—

> "*Les partisans de l'allongement ne persistent plus;* mais il restait à démontrer comment, les ventricules se raccourissant, le cœur se porte en avant."

BÉRARD, *Cours de Physiologie*, Paris, 1851, tome iii. page 603, speaking of the systole, says:—

> "Le sommet des ventricles se rapproche de la base, et la base du sommet; *il suit de lá que le cœur se raccourcit.*"

M. H. MILNE EDWARDS, in his *Leçons sur La Physiologie et L'Anatomie comparée de l'Homme et des Animaux*, tome iv. page 19, now in course of publication, in speaking of the systole of the heart, says:—

> "En effet, il devient presque circulaire à sa base; la portion voisine de la région ventriculaire se bombe d'une manière assez régulière, *et la portion inférieure qui avoisine la pointe rétrècit et se raccourcit.*"

Finally, in the *Traité de Physiologie considérée comme science d'observation*, par C. F. BURDACH, Professor à l'Université de Konigsberg, translated into the French by Jourdan, we have the opinion of the German physiologists; for Burdach was assisted in the preparation of this work by Baer, Mayen, Meyer, J. Müller, Rathke, Valentin, and Wagner: tome vi. page 234, he says:—

> "La contraction, *ou systole*, s'opère avec la rapidité de l'eclair. Le cœur se reserre sur lui-même; il devient plus ferme et plus dur; *il se raccourcit*, c'est à-dire que sa base et son sommet se recourbe un peu."

We thus see what a weight of authority there is in favour of the shortening of the heart during the systole; all of the English, French, and German authors holding this opinion, and all of them denying the description of Harvey, who states that the heart elongates during contraction; "that it is everywhere contracted, but more especially towards the sides, so that it looks narrower, *relatively longer*, more drawn together."[1] It is only in this country that this opinion has been controverted; and though experiments have been made in England, with reference to this point,[2] they confirmed the prevalent view, and American experiments thus far have stood alone.

In November, 1839, Drs. PENNOCK and MOORE made a number of experiments upon the hearts of rams and young calves, in order to settle disputed points in the change of the form of the heart during its action, and the mechanism of the production of the heart sounds. These were published in the *Philadelphia Medical Examiner*, No. 44, and also in the American edition of *Hope on the Heart*, 1846, page 59. It is not my object minutely to detail these experiments; I will simply state that the animals operated on were stunned by a blow on the head, a bellows introduced into the trachea, by means of which artificial respiration was kept up, the chest opened, and the movements of the heart observed. With reference to the form and length of the heart during its systole, in all of these experiments, Drs. Pennock and Moore found *that the heart elongated.* Its elongation was measured with an ordinary shoemaker's rule, and found in one experiment (an ewe, one year old), to be one quarter of an inch.

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[1] Harvey's Works, published by the Sydenham Society, page 21.

[2] Experiments on the Motions and Sounds of the Heart, by the London Committee of the British Association for 1838-39, and 1839-40. Experiments for 1839-40. Hope on the Heart, Amer. ed. 1846, page 65.

There are many sources of difficulty in examining a phenomenon, apparently so simple as that of elongation or shortening during the systole of the heart. In the first place, in the warm-blooded animals, as the dog, the heart's action is so rapid that it is difficult at first to determine even which is the systole and which the diastole. Then in examining the heart when the lungs are being alternately filled and emptied, partly covering the organ at each expansion, its apex only is seen, and that appears to retract when the heart contracts. In order to demonstrate the period of contraction in systole of the ventricles, I have employed the proceeding of Harvey, of pushing a small silver tube through the walls of the heart into the left ventricle, withdrawing the stylet; at each systole, a small jet of blood is forced through the tube, which enables one to determine at a glance when it takes place. In order to determine the period of elongation and shortening of the heart, I have devised an apparatus by means of which this phenomenon is exaggerated, and can be made apparent to any number of witnesses; so that by introducing the canula, the period of ventricular contraction may be determined at the same time with the alterations in the length of the heart, and their relation to each other incontestably established.

This apparatus, which I have called the *mekeoscope*,[1] is simple in its construction, and easily applied to the exposed heart of a living animal. The one which I have used in my experiments is represented by the accompanying figures. It consists of a piece of light wood (*A*) about three inches square, and from $\frac{1}{8}$th to $\frac{1}{6}$th of an inch in thickness, slightly hollowed out at one edge. Near one end are fixed two uprights (*B*) $2\frac{1}{2}$ inches in height, and between them a thin piece of wood (*C*) is so arranged upon a cross-bar (*F*), which moves on pivots (*D*), that any motion at the lower extremity is indicated by the long arm above. This is kept in place by a slender elastic thread (*E*) attached to the uprights behind, and passing over it in front. Any movement at the lower end of the indicator may be still farther exaggerated by attaching a feather to its upper extremity.

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[1] From μῆκος εος, length, and σκοπειν, to observe.

In using this apparatus, the heart of the animal is placed upon it so that its apex comes in contact with the lower end of the indicator. A small tube may now be introduced into the left ventricle through its walls, and the instrument will indicate elongation of the heart at every systole which is marked by the jet of blood propelled through the tube.

Fig. 1.

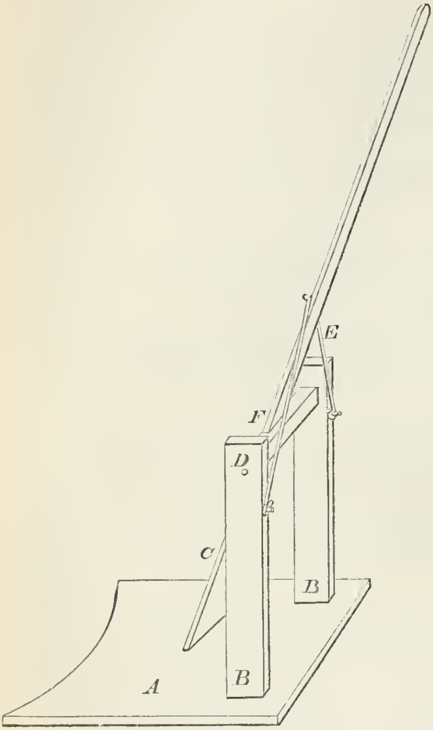
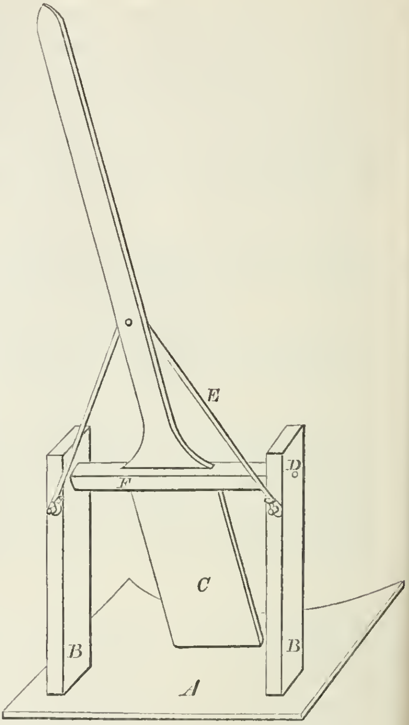


Fig. 2.



The lower end of the indicator is kept in contact with the apex of the heart by means of the elastic thread; and as it might be said that pressure upon the apex during its diastole was the cause of the apparent shortening of the heart at that time, I removed it, and attached the indicator to the heart by means of a thread passed through the apex. The instrument did not follow the movements of the heart so completely as before, but elongation during systole and shortening during the diastole were still marked.[1]

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[1] The experiments which I have made upon the heart of the dog are numerous, and their results have been nearly identical. I shall, therefore, detail such as have reference to the various questions which are to be taken up in this paper, and where succeeding observations have merely confirmed them, simply state the fact.

In reasoning from the action of the heart in the lower animals to the corresponding function in man, we must take into consideration similarity of structure and arrangement of the organ, and also take care that the ordinary conditions of life should approximate as nearly as possible to those in the human subject. For this reason our most valuable experiments are on the warm-blooded animals; and the phenomena which we find here are not always verified when we descend in the scale. I have not touched upon the change in form of the heart in the cold-blooded animals in the body of this paper; for, though such investigations are interesting in themselves, they do not teach us much with regard to human physiology, which is, of course, the great end of all our physiological inquiries. I may here state, however, that in the turtle the heart shortens during systole. This is due to the thinness of the ventricle and the great size of its cavity compared with the warm-blooded animals. The heart of the frog, also, shortens slightly during systole, and I have been able to measure the actual extent of shortening by a pair of ordinary dividers. An American observer[1] has described an experiment, which I have often repeated, to prove the elongation of the frog's heart during contraction, which consists in holding the heart by the base between the thumb and finger, with the apex upward, and irritating it with the point of a needle. At each irritation when the apex will be elevated, giving an appearance of elongation. This appearance is not deceptive; the heart actually elongates, but the position in which it is held, the ventricle being empty, causes its flaccid walls during relaxation to collapse, shortening the heart more than is natural. The same experiment I have repeated with the heart of the turtle; but, in altering the position of the heart and allowing the apex to hang downward, the heart will be found to shorten during the systole, the dependent apex being drawn up by the muscular contraction. These experiments prove nothing one way or the other. It is better, in all experiments of this description, to observe the heart *in situ*, while its cavities are filled with blood. In observations upon the irritability and various properties of the anatomical elements of the heart, we can study phenomena in cold-blooded animals with advantage; for here the properties are the same, modified only by the vital condition of the animal, which, by diminishing the intensity of their manifestations, render their study more simple.

The following experiments were made with reference to the change in the length of the heart during the systole or contraction:—

Experiment I. Jan. 28, 1861.—A good-sized dog was poisoned with woorara, artificial respiration was kept up, and the heart, which was beating strongly and naturally, exposed in the usual way. Upon holding the base of the heart between the index and middle fingers, the thumb, placed upon the apex, was sensibly raised at each systole, which was marked by the hardening of the ventricles. The mekeoscope was now applied, and indicated elongation with every systole, or contraction of the ventricles. The systole of the heart was also marked by slight corrugation of the surface of the ventricles, by a tilting movement of the apex upwards and from left to right, and by a twisting movement of the heart on its axis, from left to right.

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[1] Dalton's Treatise on Human Physiology, 2d edition, page 258.

Expt. II. Feb. 1, 1861.—A medium-sized dog was etherized, and the heart exposed in the usual way. The facts which are recorded in Expt. I. were demonstrated upon this animal. The mekeoscope was applied to the heart, which was acting normally, and indicated elongation during the systole. This point was verified by several medical gentlemen. The upper extremity of the indicator moved from one-half an inch to an inch with every beat of the heart. It was determined that the heart elongated during the systole, by introducing a small silver canula into the left ventricle, and noticing that the indicator showed elongation every time a jet of blood was forced through the canula.

Expt. III. Feb. 8, 1861.—A large dog was poisoned with woorara, and the heart exposed in the usual way. The heart was pulsating well; the mekeoscope was applied, and elongation during the systole was demonstrated. The various points recorded in Expt. I. were confirmed in this animal.

Expt. IV. Feb. 15, 1861.—A medium-sized dog was etherized, and the heart exposed in the usual way. The mekeoscope was applied, and the points recorded in the preceding experiments were confirmed.

Expt. V. Feb. 19, 1861.—A good-sized dog was etherized, and the heart exposed in the usual way. The points recorded in the preceding experiments were confirmed in this.

Conclusions.—From the five observations here reported, which I have repeatedly confirmed in unrecorded experiments, there is one legitimate conclusion, viz: *that the heart of the dog elongates during the systole or contraction of the ventricles.* In reasoning from the inferior animals to the human subject, taking into consideration the anatomical characters, we find that the heart of a dog has the same essential anatomy as that of man. But instances are on record where the heart has been exposed to observation even in the human subject. Harvey states, in his report of the remarkable case of the son of the Viscount Montgomery:—

> "We also particularly observed the movements of the heart, viz., that in the diastole it was retracted and withdrawn, while in the systole it emerged and protruded; and the systole of the heart took place at the moment the diastolic impulse in the wrist was perceived: to conclude, the heart struck the walls of the chest, and became prominent at the time it bounded upwards and underwent contraction of itself."[1]

Haller states that, in the case of ectropia of the heart which he had an opportunity of observing, the heart shortened during its systole, as it did in animals that he examined. Both of these eminent physiologists had the opportunity of examining the action of the heart in the human subject, and both verified their previous observations on animals, though the results were contradictory.

It seems, then, a legitimate conclusion that, in man, as in the animals examined, *the heart elongates during its systole.*

Having come to this conclusion from actual observation, the next step is to endeavour to account for it by the anatomical arrangement of the muscular fibres of the heart. This can easily be done; for, if a heart be boiled so as to dissolve the areolar tissue which holds together its muscular bundles, the fibres can easily be separated and traced, and we have, on the outside, a layer of fibres, common to both ventricles, taking a spiral course from left to right, from the base to the apex; and if we remove these superficial fibres, we will find beneath them a mass of circular fibres, enveloping separately the right and left ventricles. The action of these circular fibres in shortening is, of course, to increase in diameter; and this increase in diameter, from the arrangement of the fibres, would produce elongation of the body of the heart.

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[1] Harvey's Works, published by the Sydenham Soc., page 384.

The powerful action of these deep circular fibres of the heart is also shown by a phenomenon noticed during contraction, namely, the production of rugæ on the surface of the ventricles. This appearance is not mentioned by Harvey, but is noticed by Haller in the work I have before quoted, vol. i. page 389.

> "*Quando cor quietum, aut relaxatum, a stimulo quocunque in motem cietur, tunc apparent in externa cullis superficiæ rugæ, in quas fibræ contractæ crispantur, undulatæ, in rana et anguilla evidentur transversæ, neque in cane, fele, aut aliis calidi sanguinis animalibus obscuræ.*"

This may be because the superficial fibres, being exposed to the air, are more irregularly and less powerfully contracted than the deep, or it may be a phenomenon which always takes place. At all events, it indicates that the powerful contraction of the deep circular fibres throws the superficial ones into slight longitudinal folds from the greater efficiency of their action; and that the superficial fibres, which from their arrangement might tend to shorten the heart, do not compress, in their contraction, the deep fibres, but that the latter are the more powerful agents in the systole. Thus what is demonstrated by observation of the action of the heart in the living animal, may easily be accounted for by the anatomical arrangement of its muscular fibres.

In regard to the hypothesis of Bassuel, which is so often quoted, that elongation of the heart, by putting the cordæ tendinæ on the stretch, would prevent the closure of the auriculo-ventricular valves, and is, therefore, impossible, I have nothing to say. It seems to me sufficient to have demonstrated on the living animal the elongation; and I have this simple *fact* to oppose to any hypothetical objection.

Cause of the Rhythmical Contraction of the Heart.—The cause of the regular and intermittent contraction of the heart is obscure; and the experiments which I have made on this subject, though far from being as satisfactory as the preceding, still, I conceive, define the extent of our knowledge, and bring to light some laws which regulate the action of this organ. It was first supposed that the blood, circulating through the heart, was the cause of its rhythmical contraction; but the heart will continue to beat regularly after it has been emptied of blood, and removed, indeed, from the body. The atmosphere was then supposed to supply the place of the blood as a stimulus; but the heart of a frog has been placed under the receiver of an air-pump, and still it continued to pulsate. Without going farther into the opinions now entertained by physiological writers, it is sufficient to state that we are not yet fully acquainted with the real cause of the rhythmical contraction of the heart; and the following experiments were instituted with the hope of throwing some light upon this obscure subject.

Expt. VI.[1] Nov. 14, 1860.—An alligator, six feet in length, was poisoned with woorara, the thoracic cavity opened, and the heart exposed. Some experiments were then made upon this organ which will be detailed in another place; but twenty-four hours after the operation, the heart, which had been left in situ, was found beating regularly and with considerable force.

Expt. VII. Jan. 28, 1861.—An alligator of the same size as the one used in Experiment VI., *i. e.*, six feet in length by measurement, was poisoned with woorara, the chest opened, and observations made upon the heart. The heart was left in situ, and in twenty-four hours after death was found pulsating vigorously and regularly. The auricles were then galvanized by an ordinary magneto-electric apparatus, during the intervals between the movements of the organ; they immediately contracted, and their contraction was immediately followed by contraction of the ventricles. Upon applying the stimulus to the ventricles they contracted, contraction of the auricles following immediately. These phenomena were repeatedly verified in the presence of two assistants; the same result followed irritation with the point of a scalpel. The heart was then removed from the body, and emptied of blood. When placed upon the table, it pulsated quite rapidly (about ten times per minute, instead of four or five), but its contractions were feeble. Upon galvanizing the ventricles, they contracted powerfully, followed by feeble contractions of the auricles. Upon galvanizing the auricles, they generally contracted feebly, and sometimes no movement was excited; but the ventricles contracted invariably.

The aortæ (there are two in the alligator) were then tied, and the heart filled with blood (which was prevented from coagulating by the addition of a little solution of carbonate of soda) by injecting it through the right auricle, and confining it by a ligature. The heart then commenced to contract regularly and forcibly. The auricles contracted first, and then the ventricles, making about four pulsations per minute. The contractions were now powerful and regular, contrasting strongly with the rapid and feeble action before the organ had been filled with blood. The heart was evidently over-distended, but was relieved by dividing the coronary artery, and allowing some of the blood to escape, until it was reduced to about its normal condition of fulness. Galvanization of the auricles excited contraction, followed by contraction of the ventricles, and the same stimulus applied to the ventricles excited contraction, followed by contraction of the auricles, in about the same manner as when these experiments were made upon the organ before its removal from the body. This, also, was repeatedly verified. The heart was then emptied of blood, and placed upon a clean plate. The contractions became such as were noted immediately after the heart had been removed from the animal, and before it had been filled artificially with blood.

The heart was then filled with water. The contractions were not so powerful and regular as when it had been filled with blood, and were limited chiefly to the ventricles. They were also much more rapid. It was impossible to establish the contraction of the auricles on galvanization, followed immediately by contraction of the ventricles, and the reverse as when the heart was filled with blood. The ventricles, still filled with water confined in their cavity, were then firmly compressed by the hand, so as to subject the muscular fibres to powerfu compression. From that time the heart entirely ceased its contractions, and became hard, like a muscle in a state of cadaveric rigidity. The experiment was then terminated *twenty-eight* hours after the death of the animal; the heart was then beating until its pulsations were arrested in the manner described.[1]

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[1] For the anatomy of the heart of the alligator, see Appendix.

Expt. VIII. *On Turtles.*—The hearts of turtles were exposed and removed from the body while pulsating. Galvanism applied to the auricles induced contraction, followed by contraction of the ventricle; and a stimulus applied to the ventricle induced a contraction followed by contraction of the auricles. This took place whether the irritation were galvanic, or mechanical, like the point of a needle, and indifferently whether the heart were removed from the animal or left *in situ*.

These observations were repeatedly verified upon the same turtle, and in a number of subsequent experiments.

Expt. IX. March 11, 1861.—The heart of a turtle was removed, and the ventricle separated from the auricles. The auricles contracted spontaneously and regularly for twenty minutes, the time during which their movements were observed, and the ventricle contracted irregularly and at intervals of two minutes or more. The ventricle always contracted when irritated with the point of a needle.

(In this experiment I was not certain that the ventricle contracted without the intervention of a stimulus, for it was exposed to currents of air, jars of the table, etc., which might be capable of inducing contractions.)

Expt. X. Mar. 13, 1861.—The heart of a turtle was removed from the body while it was beating regularly, and the ventricle separated from the auricles as in the preceding experiment. Both auricles and ventricle were then placed under a bell glass and carefully observed for an hour and thirty minutes.

When placed under the bell glass, the auricles contracted regularly from 12 to 16 times per minute. No contraction of the ventricle.

Five minutes after. Auricles the same and the ventricle contracted once.

Seven minutes after. Auricles contracting regularly 16 per minute, ventricle contracted. (The apparatus was shifted from one table to another, which might have been the cause of the ventricular contraction.)

Ten minutes. Auricles the same, and ventricle contracted.

Eleven minutes. Ventricle contracted.

Twelve minutes. Ventricle contracting regularly five times in two minutes.

Twenty-two minutes. Ventricle contracting regularly seven times in two minutes; auricles contracting twenty-two times per minute.

Thirty-two minutes. Ventricle contracting four times per minute; contractions of auricles rapid but irregular.

Forty-two minutes. $1\frac{3}{4}$ minutes between the contractions of the ventricle.

One hour and thirty minutes. Auricles contracting eight times per minute; two minutes between the contractions of the ventricle.

Expt. XI. Mar. 13, 1861.—The heart of a turtle was removed and placed under a bell glass.

Thirty minutes after. It pulsated twelve times per minute, contraction of the auricles always preceding that of the ventricle.

Sixty minutes. The heart pulsated six times per minute, the auricles contracting first.

(In making these experiments, it was found that the operation of removing and dividing the heart produced a shock which interfered at first with its action. The heart recovers from it, however, in about thirty minutes.)

Expt. XII. Feb. 15, 1861.—A medium-sized dog was etherized, and his heart exposed in the usual way, artificial respiration being kept up. While respiration was being actively performed by means of bellows, and while the heart was pulsating vigorously, the organ was suddenly removed from the body by a single sweep of the knife. It was immediately placed upon the table, and contracted so vigorously that *it bounded up at every pulsation like an India-rubber ball.* This remarkable phenomenon lasted for a few seconds only, but the heart pulsated regularly for two minutes. A powerful shock was then passed through it by means of the magneto-electric apparatus with the effect of immediately arresting all regular pulsations, but was followed by a general, irregular, vermicular action of the fibres. This continued for thirty minutes. At first, irregular contractions could be excited by feeble currents of galvanism, but after thirty minutes this became impossible. When the vermicular action of the muscular fibres had ceased, no contraction could be excited by galvanic or mechanical stimulus.

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[1] These observations were made twenty-four hours after the death of the animal.

Expt. XIII. Mar. 13, 1861.—A turtle was poisoned with a variety of woorara, which arrests or depresses the action of the heart, by injecting about a grain of it, in solution, under the skin. In thirty minutes the animal was dead and the heart was exposed, which was beating feebly and slowly. On applying galvanism to the exposed muscles their irritability was found, by actual comparison with the exposed muscles of turtles which had not been poisoned, to be very much diminished.

Expt. XIV. Mar. 13, 1861.—The preceding experiment was repeated upon another turtle. When all signs of life had disappeared, the heart was exposed and found beating feebly. Muscular irritability was much diminished.

It will be seen by these few experiments that it is difficult, if not impossible, in the present state of our knowledge, and with such data alone, to say why the heart contracts in the manner which is characteristic of it. If the cause reside in the nervous system, it must be in nervous centres existing in the very substance of the organ. In short, the contraction of the heart is dependent either upon nerves in its substance, or, upon an inherent property peculiar to its muscular fibres. The nervous influence, if there be any, must come from the sympathetic or organic system, because an organ must remain connected with the cerebro-spinal centres in order that any influence should be derived from this system.

Dr. Robert Lee, of London, has demonstrated the existence of sympathetic ganglia in the substance of the heart; but it is impossible to say positively that an influence derived from these is the cause of its rhythmical contractions. The most that we can say on this subject is, that the muscular fibres which go to form the heart have an inherent property of contraction, so long as they are in a state of physical and chemical integrity; that this contraction, like that of all other muscles, is followed by a relaxation, but the fibres of the heart, after the short period of repose which is thus allowed them, contract again. I know that in this statement we are simply describing the phenomena of the heart's action, and confessing our ignorance as to its cause; but we are in the best position to acquire information upon any subject when we admit the real state of our knowledge, and do not attempt to explain what, with our resources, is incapable of explanation.

Having thus stated the sum of our actual knowledge of the cause of the heart's action, we are prepared to study some of the properties of the muscular fibres of this organ, and the laws by which their contractions are regulated.

1. The muscular fibres of the heart possess, in a remarkable degree, that property known as irritability. This is more marked in the auricles than in the ventricles. They contract readily upon the application of a stimulus

applied to the surface, and Virchow has demonstrated that the internal surface is much more irritable than the exterior.

2. It has been shown by some experiments instituted by Erichsen,[1] that the action of the heart is arrested in about thirty minutes, in the warm-blooded animals, by ligature of the coronary arteries, artificial respiration being continued; showing that the presence of a certain quantity of blood in the substance of the organ is necessary to the irritability of its muscular fibres.

3. Experiments here detailed, as well as those of others, demonstrate that the heart of the cold-blooded animals, especially the alligator, retains its irritability for a long time after death. In Expt. VII. the heart was beating vigorously twenty-eight hours after death, when it was artificially arrested. This was due in part to the action of woorara; for Bernard has lately shown that muscular irritability remains in frogs poisoned with this substance much longer than ordinary, and that the action of the heart is also prolonged.[2] This property renders the woorara a valuable agent in studying the movements of the heart.

4. The same experiments (on turtles and alligators) show that a stimulus, mechanical or galvanic, applied to one part of the heart, is propagated to the other; and tend to show that the stimulus which, in the natural action of the organ, excites the auricles to contraction, is propagated from them to the ventricles. These experiments are not new. The same thing has been noticed by Mr. Paget in the heart of the turtle, and was published by him in the *British and Foreign Medico-Chirurgical Review*, vol. xxi. page 550.

5. Experiments IX. and X. show that the irritability of the auricles and ventricles are separate and distinct; that the auricles possess this irritability to a much greater extent than the ventricles, as demonstrated by the distinct contractions of auricles and ventricles when separated from each other, and the much greater frequency of contractions of the auricles. That the contraction of the auricles acts as a stimulus to the ventricles; for when they are left together, as in Expt. XI., and the heart removed from the body, the auricles always contract first, and their contraction is invariably folowed by contraction of the ventricles.

6. Experiment VII. shows that the heart of the alligator, if emptied of blood, does not contract regularly; but that its regular contractions are esumed if the blood be injected into, and confined in its cavities. Also

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[1] These experiments were made by pithing the animal, keeping up artificial espiration, and opening the chest. It was found that the heart continued to beat nder those circumstances, for from one to two hours, but was arrested in a short me if the coronary arteries were ligated. The mean of six experiments showed he duration of the heart's action, after ligation of these vessels, to be 23½ minutes. he experiments are to be found in the *Medical Gazette*, July 8, 1842.

[2] Bernard, "Substances Toxiques et Medicamenteuses," page 320 *et seq.*

that the propagation of stimulus from auricles to ventricles is not invariable in the heart emptied of blood, but that it may always be demonstrated in the heart filled with blood, naturally and artificially.

7. The same experiment shows that the heart filled with water will not act naturally after removal from the body as it will if blood be injected into its cavities, but more rapidly and less effectually; and, finally, that great compression seems to paralyze the muscular fibres instantly and cause them to take on cadaveric rigidity.

8. Experiment IX. shows that a powerful galvanic shock passed through the substance of the heart, in warm-blooded animals, immediately puts a stop to all regular pulsation.

9. Articles which abolish or diminish general muscular irritability like the sulphocyanide of potassium, have a corresponding effect upon the heart. This is a fact which is now well established.

Experiments XIII. and XIV. show that a certain kind of woorara which arrests the action of the heart, diminishes very much the general muscular irritability. This goes to prove the identity of the irritability of the heart and of the general muscular system.

Conclusions.—From the facts above enumerated, the following deductions can legitimately be made:—

The natural stimulus of the regular movements of the heart is the blood; and this stimulus cannot be adequately supplied by any other fluid of lesser density, like water. So that, in conditions in which the blood becomes watery, as in the reaction after copious bleeding or anæmia, we have feeble and rapid contractions of the heart; and in affections in which the blood becomes denser than in health, as in plethora, the heart contracts more slowly and with abnormal force.

In the natural action of the heart, this stimulus first affects the auricles, which are first distended with blood, and is propagated thence to the ventricles.

All irritability of the muscular fibres of the heart may be immediately arrested by forcible compression; and its property of regular contraction may be abolished by a powerful galvanic current.

A peculiarity about the muscular irritability of the heart is, that when the organ has ceased to contract spontaneously while in the chest, or after removal from the body, contractions cannot be excited by ordinary stimuli, such as irritation with the point of a needle or scalpel, or galvanism; while such irritation applied to any of the muscles will produce contractions. In an experiment which I made upon this point upon the heart of a dog, I found that the heart ceased beating in about ten minutes after the stoppage of respiration (the dog had been etherized and his heart exposed), and that after that time galvanism applied to the heart failed to produce contraction, though the sterno-mastoid and muscles of the chest, which had been exposed during the operation, contracted powerfully on the application of the stimulus. This favours the idea that the muscles of the heart differ from the other striped muscles in possessing the inherent property of regular contraction, for they continue to contract till they have lost their irritability, and then cannot be excited to action artificially. This is only true when the heart is allowed to stop spontaneously, and the duration of its pulsations is not interfered with by placing it in a vacuum,—which, while it does not arrest, abridges the duration of the heart's action,—or by other means.[1]

The irritability, which in ordinary muscles is manifested by their contraction upon the application of a stimulus, and, in the case of the heart, by regular pulsations so long as the fibres retain their integrity, is really identical in the heart and general muscular system; it is greatest in the heart, and is much greater in the auricles than in the ventricles, as shown by experiments. In the heart this irritability becomes extinct before general muscular irritability is lost, for the regular contractions of the organ after death, or after removal from the body, wear it out; while the general muscular system, if unstimulated, is in a state of repose. It is also true that muscular, like nervous irritability, disappears soonest in parts where it is most intense, as it does in animals like the warm-blooded, the functions of which are most active. The ventricles seem to depend for their stimulus upon the contraction of the auricles; for when separated, as in Expt. X., the ventricles do not contract as frequently as the auricles, nor as frequently as when their connection with them is not severed. The ventricles possess then an independent irritability which is much less than that of the auricles.

The irritability of the heart is like the general muscular irritability in another respect. Most agents which paralyze the muscular system paralyze the heart; and Expts. XIII. and XIV. show that the peculiar variety of woorara which acts upon the heart, diminishes, to a great extent, the irritability of the general muscular system. On the contrary, the most common variety of woorara, which paralyzes the motor nerves and the sympathetic system, leaves the muscular irritability intact, and also the movements of the heart, which will continue for a long time after death, if respiration be artificially performed. This disproves the view of some physiologists that the heart acts in obedience to a stimulus derived from the sympathetic ganglia located in its substance.

Mechanical Causes which Arrest the Heart's Action.—In asphyxia, and in some organic diseases of the heart, we have arrest of the action of this organ. When this is caused by mechanical obstruction, as in disease of the aortic orifice, we attribute death to over-distension of the heart; but in asphyxia it becomes a question whether death be due to this cause, or to the circulation of black blood in its substance, as was supposed by Bichat. In experiments upon the lower animals, when we expose the heart and keep up artificial respiration, we can easily see the immediate effects of arrest of respiration upon its action. It becomes distended, changes from a red to a blue colour, showing that venous blood is circulating in its substance, and gradually its movements cease. But if respiration be recommenced before its action has been entirely arrested, it immediately becomes florid, its distension is gradually relieved, and soon its normal action is re-established. In order to determine the cause of stoppage of the heart in asphyxia, I have made the following experiments.

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[1] I have not made a sufficient number of experiments to be able to state this positively, as a general law; but it is certain that the general muscular irritability continues long after the heart has ceased to beat: and the question arises, when we notice the heart of a cold-blooded animal in a quiescent state, but contracting upon irritation, whether it does not contract spontaneously, but at remote intervals, as in Expt. X. This question could only be answered by more extended observations.

Expt. XV. Feb. 1, 1861.—A dog was etherized at 2.15 P. M.; the chest was opened in the usual way. At 2.25, I stopped respiration. In fifty seconds the heart became black and much distended. Respiration was recommenced, which had the effect of soon restoring normal action. The pulmonary artery and aorta were then tied suddenly with a strong cord; the heart became much distended, was of a red colour, laboured more than when respiration had been stopped, and in forty seconds it became necessary to remove the ligature for fear of permanently arresting its action. After removing the ligature, the heart gradually returned to its normal condition, *but more slowly than when respiration had been arrested for fifty seconds.*

At 2.40 a grain of woorara was injected into the areolar tissue. At 4.10 the aorta was compressed; the heart laboured, and in twenty-five seconds the compression was removed, and it gradually resumed its normal action. Respiration was then suspended with the same effect on the heart. In one minute respiration was recommenced, and the heart resumed its natural action.

In this experiment, compression of the aorta and pulmonary artery produced more trouble in the heart's action, the trouble came on more rapidly, and it was longer before its action became natural, than when respiration was stopped; though when the vessels were compressed the heart was florid, showing red blood circulating in its substance, and when respiration was arrested it became dark.

Expt. XVI. Feb. 8, 1861.—A large dog was poisoned with woorara, and the chest opened in the usual way. Respiration was stopped for TWO *and a half minutes.* The heart became very dark, much distended, and laboured; but when respiration was recommenced it became gradually relieved, and in a few minutes regained its normal action. The aorta was then tied for *two minutes.* The heart remained red, became more distended, and laboured more than in the previous instance, but gradually resumed its action after the ligature was removed. During the time that the aorta was compressed, here, as in Expt. XV., respiration was continued.

In this experiment I wished to ascertain how long the heart could be kept distended by asphyxia or compression of the great vessels, and yet resume its functions when the cause of the distension was removed.

Conclusions.—Great distension of the heart will produce paralysis of its muscular fibres, and this is the cause of the arrest of its action in asphyxia, and in many cases of sudden death; not the circulation of venous blood in its substance, as was supposed by Bichat. The experiments which I have detailed demonstrate this fact with regard to asphyxia; for here it is shown that the greater the amount of distension, the sooner does the heart cease its contractions. The heart is arrested sooner by ligature of the great vessels, when red blood circulates in its substance, than by arrest of respiration, when it is supplied with black blood, because in the first instance the amount of distension is greater.

The mechanism of this muscular paralysis is the same as that of the paralysis of any striped muscle by straining. If a muscle be violently extended, as in a dislocation, we have loss of function for a period proportionate to the severity of the strain. The same is true with regard to the heart; but the constant action of the heart is necessary to existence; and when this muscle is paralyzed by straining of its fibres by distension, the animal dies before it has time to recover its functions. In case of asphyxia, then, so long as the heart continues to act, though feebly and at long intervals, artificial respiration will probably restore life; but after its action has been suspended, there can be little or no hope of restoring it by this or any other measures.

Cases of sudden death from organic disease of the heart, contrary to the popular impression, are not common; and the only form of this affection in which sudden death is likely to occur is disease of the aortic orifice. In this form of the affection, the heart is liable to over-distension from any cause which increases the force and rapidity of the circulation; and death results from stoppage of the heart, in the same manner as when we ligate the aorta, as was done in the experiments before detailed.

In death from injury to the head, as from apoplexy, respiration is interfered with, and distension of the heart occurs in precisely the same way as when we interrupt the action of the bellows in our experiments upon the lower animals. This is farther illustrated by the experiments of those observers who stun the animals upon which they operate in order to observe the action of the heart; if artificial respiration be not immediately established, the heart ceases to act from distension, and the animal dies.

In death from poisoning by opium, the respiratory muscles are paralyzed by the poison, and the heart ceases to act in the same manner in which it does in other instances of asphyxia. It would then follow that if artificial respiration be kept up until the power of the poison be exhausted, and natural respiration be gradually restored, the life of the patient would be preserved; and the well-known experiments of Sir Benjamin Brodie with opium and woorara have proved that this is the fact.

In some cases of convulsions, where death occurs, respiration is interfered with, and the heart is arrested by over-distension. This is true of all nervous diseases which, from their action upon the general system, or upon the respiratory apparatus, produce death.

In death from introduction of air into the veins, the air going to the right side of the heart is divided into minute bubbles which cannot pass through the lungs. The heart becomes distended from this obstruction, and ceases to contract from over-distension.

We thus find that distension of the heart is able, by its mechanical action on the muscular fibres, to cause stoppage of this important organ, and death; that sudden death may generally be attributed to this cause; that the cause of this distension may usually be referred to the respiratory function; and that the indications are, therefore, to re-establish this function, by artificial respiration or otherwise, when it is arrested, or to prevent the diseases under which the patient may labour from interfering with it.

Influence of the Pneumogastric Nerve on the Action of the Heart.—The heart, like other of the striped muscles, is provided with nerves derived from the cerebro-spinal system; but the action of the nerves which go to the heart differs from the nervous influence exerted upon any other muscle. If we divide a nerve which is distributed to a voluntary muscle, that muscle is paralyzed. But if we divide the pneumogastric nerve, which is distributed in part to the heart, this organ, far from being paralyzed, is accelerated in its action. Bernard has found that division of the pneumogastrics in the neck increases the number of cardiac pulsations, sometimes even doubling them; but that the force of these contractions is diminished. When we galvanize the peripheral end of a divided nerve going to a muscle, the muscle is thrown into violent contractions. But when we galvanize the peripheral ends of both pneumogastrics, the action of the heart is arrested. This experiment was made in 1845 by Weber, and has been repeatedly verified by physiologists since that time; but the cause of this peculiarity of action has never been satisfactorily explained.

In the first place, it is important to determine whether the galvanic stimulus be conveyed to the heart directly through the motor filaments of the pneumogastrics, or through the sensory filaments to the nervous centres, and, by reflex action, operates through other nerves on the heart. This is easily ascertained by dividing both pneumogastrics and galvanizing alternately the central and peripheral extremities; when it is found that the galvanic current applied to the peripheral extremities will arrest the action of the heart, while the same stimulus applied to the central ends produces no such effect. By means of woorara, the motor nerves and the motor filaments of the mixed nerves are paralyzed, and the two systems are dissected out, as it were, by this curious poison; and we find that when the pneumogastric nerves are galvanized in an animal poisoned by this agent, it is impossible to arrest the action of the heart. This fact was pointed out by Bernard,[1] and has been repeatedly verified by myself.

If both pneumogastric nerves of a dog be isolated in the middle of the neck, and subjected to a slight galvanic current, the first effect which we notice upon the movements of the heart, when this organ is exposed to our view, is a diminution in the frequency of its pulsations. If the current be then gradually increased in intensity, the heart becomes arrested; it remains dilated instead of contracted; and it ceases to act so long as the current is continued. When the galvanization is stopped, the heart soon commences to beat, and in a few minutes has resumed its normal movements. This effect is produced in most of the inferior animals, and can readily be shown in the frog, turtle, alligator, and other cold-blooded animals, which are well adapted to experiments on the heart and on the nerves; but in birds, Bernard has not been able to demonstrate it,[1] for what reason, he does not state. When we apply our galvanic stimulus directly to the heart, as I have done in some instances, after the organ has been removed from the chest, we put a stop, if the current be sufficiently powerful, to all regular pulsations, and have nothing but the irregular vermicular action which is observed when the irritability of this organ has become nearly exhausted. This fact I have observed in the heart of the dog.

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[1] Bernard, "Substances Toxiques et Medicamenteuses," p. 348.

Endeavouring to throw some light upon the cause of arrest of the heart's action by galvanization of the pneumogastrics, I instituted the following experiments upon the dog, turtle, and alligator:—

Expt. XVII.—The heart of a large dog was exposed in the usual way while the animal was under the influence of ether. After the chest had been opened, and while artificial respiration was being kept up, the pneumogastric nerves were isolated in the neck, and a feeble current was passed through them with the magneto-electric machine used in former experiments.

The heart was arrested by quite a feeble current, in the manner above described. This was repeated several times. The action of the heart commenced again when the current was arrested.

Expt. XVIII.—The heart of a turtle was exposed and found contracting regularly. The pneumogastric nerves were then isolated in the neck, and a feeble galvanic current passed through them. (This was effected by bending the ends of the conducting wires in the form of hooks and catching up each nerve.) The heart was immediately arrested. It recommenced when the current was interrupted, and stopped when it was resumed.

Expt. XIX. Mar. 13, 1861.—In a medium-sized dog, under the influence of ether, the carotids and pneumogastric nerves were exposed. The cardiometer (see fig. 3) was applied to the right carotid, and the following observations were made:—

Arterial pressure (constant) . . .	(Minimum) 125	millimetres.
At each action of heart . . .	(Maximum) 130	“
Pulsations	5	“

The pneumogastrics were then divided. The movements of the heart became more rapid, and the instrument marked—

Arterial pressure (very variable) . . .	100 to 150	millimetres.
Oscillations with heart's action	2½	“

The peripheral extremities were feebly galvanized. The action of the heart became slower, and the instrument marked—

Minimum	40	millimetres.
Maximum	65	“
Pulsations	25	“

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[1] Bernard, "Physiologie et Pathologie du Système Nerveux," tome ii. p. 394.

The galvanization was then arrested and the instrument marked—

Minimum	147½ millimetres.
Maximum	150 "
Pulsations	2½ "

Expt. XX. Mar. 11, 1861.—The pneumogastrics and carotids were exposed in a large dog, in which the chest had been previously opened and the heart exposed while the animal was under the influence of ether. The cardiometer was applied to the right carotid and marked—

Minimum	40 to 45 millimetres.[1]
Maximum	45 to 50 "
Pulsations	5 "

The pneumogastrics were then feebly galvanized. The pulsations of the heart were diminished in frequency, and the instrument marked—

Pulsations	20 to 30 millimetres.

Experiments XVII. and XVIII. merely demonstrate the arrest of the heart's action by galvanization of the pneumogastrics in the dog and turtle. This fact is now perfectly established, and the two experiments here recorded are merely introduced to confirm previous observations.

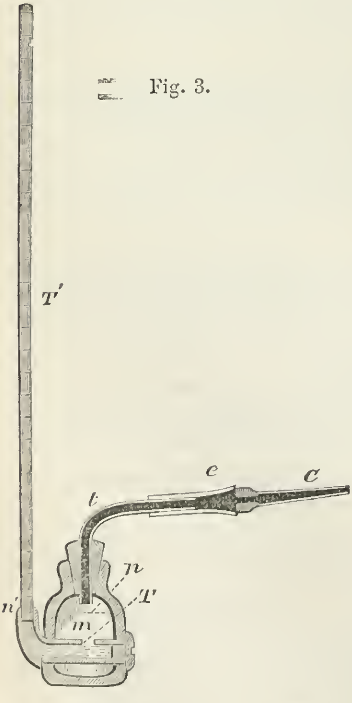

Fig. 3.

Explanation of Fig. 3.

The cardiometer is composed of a thick and solid glass bottle, pierced by an iron tube securely soldered, and having an opening (*T*) by which the mercury which fills the bottle enters. One end of the iron tube is closed, the other projects from the bottle and bends upwards in such a way as to receive at (*n'*) a glass tube (*T'*) which is graduated, and which is at most from 1-12 to 1-8 of an inch in its interior diameter.

At the upper part, the bottle is hermetically sealed by a cork pierced by a tube (*t*) of glass or iron, at the end of which is adjusted a metallic tube (*C*) designed to enter the vessel in which it is desired to measure the pressure. The tube (*C*) is joined to tube (*t*) by a tube of vulcanized India-rubber, which must be very short.

When the instrument is in operation, all of the upper part of the apparatus (*C e t*) is filled with carbonate of soda in order to prevent coagulation of the blood. The level of the mercury is (*n*) in the bottle, and (*n'*) in the small tube. This level corresponds to zero, and when the blood presses on the surface of the mercury, the pressure is communicated by the opening (*T*) of the iron tube, and the mercury ascends in the graduated glass tube. The length of the tube (*T*) should be as great as 250 millimetres for powerful pressures. (Bernard, *Propriétés et Altérations des Liquides de l'Organisme*, tome i. page 167.)

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[1] When the chest is opened, the pulsations become more frequent and the pressure of blood is much diminished; as is seen by comparing these tables with those in the preceding experiment.

Experiments XIX. and XX. show that when the pneumogastrics are divided, and the action of the heart is accelerated, its force is diminished as measured by the cardiometer; and that, when the action of the heart is retarded by a feeble current of electricity, its force is correspondingly increased. Both the arterial pressure and the pulsations are diminished in Expt. XIX. by the administration of ether, and very much diminished in Expt. XX. by the operation of opening the chest; but my object was merely to obtain the relative pressure and pulsations, and the effects of the ether and opening the chest did not interfere with these observations, in which I wished to show that when the pulsations of the heart were increased in number, their force became diminished, and *vice versâ.*

The following experiments were made to determine the influence of woorara upon this peculiar action of galvanism applied to the pneumogastrics on the heart:—

Expt. XXI.—A large dog was poisoned with woorara, and the heart exposed in the usual way. The pneumogastric nerves were then isolated, and a current of electricity passed through them. The apparatus was the one used in the other experiments, and with the most powerful current that could be produced it was impossible to affect the action of the heart. The animal had come completely under the influence of the woorara.

Expt. XXII.—A large turtle was poisoned with woorara at 1 P. M., and at 4 P. M. was quite dead. The heart was then exposed and found contracting regularly. The pneumogastric's nerves were then isolated in the neck, and a powerful current applied with the machine before described. It was impossible to arrest, by this means, the action of the heart.

(These experiments, like Nos. XVII. and XVIII., represent numerous others of a precisely similar character.)

The experiments here detailed confirm the facts that galvanization of both pneumogastrics will arrest the movements of the heart, and that woorara so acts upon these nerves as to abolish this property. This action of woorara upon the motor filaments is in common with its action upon the other motor nerves. Having an opportunity of operating upon the alligator, and wishing to repeat these experiments, and to observe, at the same time, the action of woorara upon this animal, I did so with the following interesting results.

Expt. XXIII. Nov. 14, 1860.—An alligator, upwards of six feet long, was poisoned by the injection of about three grains of woorara under the skin of the hind leg. (This woorara was of an inferior quality, and the dose was equal to about a grain of that made use of in former experiments.) In thirty minutes he came sufficiently under its influence to be easily handled. The chest was then opened, and the heart, which was pulsating regularly, exposed. The animal was quite dead by the time that the dissection was finished. The pneumogastric nerves were then exposed in the neck and galvanized. *The movements of the heart were arrested as long as the current was continued, and recommenced when it was interrupted.* Artificial respiration was kept up for some time, but this had no effect upon the action of the heart, and was only done to exhibit the play of the lungs. The animal was kept under observation three or four hours, and the foregoing singular fact repeatedly verified.

Expt. XXIV. Jan. 28, 1861.—The above experiment was repeated upon another alligator of about the same size as the first, but poisoned with the first quality of woorara. In making the dissection for exposing the heart, a small nervous filament going to the sterno-mastoid muscle was exposed, irritation of which with the scalpel induced contraction of the muscle, though the animal was quite dead. The pneumogastric nerves were exposed, and the heart's action arrested by a moderate galvanic current. The animal was kept under observation upwards of three hours, and this point repeatedly verified.

Twenty-four hours after, the heart was still beating vigorously, and could be arrested by galvanization of the pneumogastric nerves as before. The nervous filament going to the sterno-mastoid muscle was galvanized, which produced slight contractions of the muscle. Muscular irritability was very marked.

It is only in the class of birds that experimenters have met with any peculiarity with regard to the influence upon the heart of the galvanization of both pneumogastric nerves; and in this class, in proportion to their elevation in the animal scale, has it been difficult, and in most cases impossible, to arrest the action of the heart by the means which will invariably produce this effect in mammals, and more easily, even, in the cold-blooded animals. Nor have any animals been found able to resist the influence of the woorara upon the motor nerves, with the exception of the alligator. These observations should be extended to alligators of small size; but, as yet, I have not been able to procure them.

When I first noticed the phenomenon which I have described, I was at a loss to account for it; for I saw that the alligator was perfectly motionless and insensible, and that the woorara had been tolerably prompt in its action, the animal coming under its influence in from thirty minutes to three-quarters of an hour, or an hour; which, in a large cold-blooded animal, where the processes of life are languid, is as soon as we would expect. In carefully reviewing, however, my observations, I found that, in the alligator, the nervous system was much less affected by this remarkable agent than in other animals; and that while in dogs the motor nerves become entirely paralyzed, and death actually takes place by arrest of the muscles of respiration, in the alligator, when voluntary movement and the cerebral functions are abolished, so that the animal can be operated upon without the slightest difficulty, the motor nerves are still somewhat irritable. The reader will see, by reference to Experiment XXIV., that a nervous filament was exposed during the operation, and still retained its irritability as manifested by muscular contractions when it was irritated by the point of the scalpel. This persisted and was marked, though in a less degree than before, twenty-four hours after death. The properties of the pneumogastrics remained with no sensible diminution.

It is evident that the motor functions of the pneumogastric nerves, especially those connected with the heart, are more important to life than those of the ordinary motor filaments which are distributed to the general muscular system; and we can appreciate the wisdom of a provision that this nerve should be protected from disturbing influences, like the action of poison, to a greater degree than others. We see evidence of this in the numerous sources from which the pneumogastric derives its motor filaments;

anastomosing, as it does near its origin, with the spinal accessory, the facial, the sublingual, and the first and second cervicals. But we must not be satisfied with this purely anatomical explanation, if it be possible to determine its powers of resistance to poisonous agents experimentally. To do this we must employ some means of retarding the absorption of woorara, observe its effects upon the nerves of the animal from the first, and determine whether its action upon the general motor system precede that upon the pneumogastric nerve. For this purpose I instituted the following experiments, the observation on the alligator not being in itself satisfactory.

Expt. XXV. Feb. 1, 1861.—A medium-sized dog was etherized, and the chest opened in the usual way. The operation was performed at 2.15 P. M., and at 2.40 a grain of woorara, dissolved in water, was injected under the skin of the thigh. The sciatic nerve and both pneumogastrics were then isolated and galvanized. By this means, convulsive movements were produced in the leg, and the heart was promptly arrested by a feeble current.

At 3.10 the sciatic and pneumogastrics were galvanized, producing convulsions in the leg, not so marked as before, and arresting the action of the heart.

At 3.40, one hour after the injection of the woorara, the sciatic was found insensible to galvanism, but the heart could be arrested by galvanization of the pneumogastrics, though it required a powerful current. A weaker current diminished the frequency, and increased the force, of its pulsations.

At 4.10 the sciatic was still unexcitable, but a powerful current applied to the pneumogastrics arrested the action of the heart.

Expt. XXVI. March 11, 1861.—One grain of woorara of an inferior quality dissolved in water was injected under the skin of a medium-sized dog. Twenty-five minutes after, no effect being produced by the first injection, a second grain was introduced. In ten minutes signs of poisoning were manifested, the posterior extremities became partially paralyzed, and the animal was placed upon the operating table. The chest was then opened and the heart exposed, the animal manifesting no signs of pain. The pneumogastric nerves were then isolated and galvanized, promptly arresting the action of the heart. After the observation had been continued for about thirty minutes, the animal partially recovered from the influence of the woorara, and made some voluntary movements.

Aided by these experiments, we are able to understand the reason why, in the alligator, galvanization of the pneumogastrics continued to arrest the action of the heart when the animal had been poisoned with woorara. The alligator, when undisturbed, breathes very slowly; and, like other cold-blooded animals, pulmonary respiration is not necessary to the movements of the heart. Woorara seems, then, first to act upon the brain, abolishing sensation and voluntary motion, before the motor nerves are paralyzed. This was demonstrated in Expt. XXV. on the dog, for the effects of the ether which was administered in making the dissection were allowed to pass off, and the woorara which was subsequently administered abolished sensation and voluntary motion long before the motor nerves were much affected, as demonstrated by galvanization of the exposed sciatic. The general motor nerves then slowly came under its influence, and last, the pneumogastrics, though their function was not entirely abolished. By the means employed in this operation, injecting the woorara after the vital powers had been enfeebled by opening the chest, and exposing the thoracic organs to the cold air, the dog was approximated to the condition of the alligator.

In Expt. XXVI., an inferior quality of woorara was employed, which abolished the functions of sensation and volition, but had not sufficient power to entirely paralyze the general motor nerves, and had little or no effect upon the pneumogastrics. The specimen used had the well-known properties of ordinary woorara, but was deficient in power.

From these observations we can make the following deductions with regard to the action of woorara upon the nervous system. It affects volition and sensation, in whatever part of the central nervous system these functions reside, and the motor system of nerves. With regard to the order in which various parts are affected, we have, first, sensation and voluntary motion coming under its influence; then the general motor system of nerves; and last, as the preceding observations have demonstrated, the motor elements of the pneumogastric nerve, especially those which affect the heart. By an ingenious series of experiments with this substance upon frogs, Bernard has demonstrated the fact that woorara affects the motor nerves exclusively, leaving the sensory filaments intact, as well as the muscular system. He has also shown that the sympathetic system is paralyzed, for the abnormal heat and congestion which are developed in the ear of the rabbit, for example, when the sympathetic is divided, and which is reduced to the normal standard when the cut extremity is galvanized, is abolished when the animal is put under the influence of this agent.[1]

In the beginning of the section devoted to the influence of the pneumogastrics upon the heart, I mentioned that, though the phenomena which follow galvanization of this nerve are very well established, no explanation of them has yet been given which is generally received. It is plain that we must first thoroughly understand the cause of the action of the heart before we can explain a modification of this process, and this has been the great obstacle in the way of such an explanation. It now seems to me pretty well established that we cannot go farther, in explaining the cause of the heart's action, than to attribute it to an inherent and peculiar irritability of its muscular fibres, and not to the influence of the little ganglia which are found in its substance. Not only is it impossible to prove this latter supposition, but it seems to me that it can be disproved. Then we cannot take the ground which is assumed by some, that the heart is under the influence of two sets of nerves; one from the sympathetic system, which accelerates its action, and the other from the cerebro-spinal system (the pneumogastric), which retards it. Many other explanations have been offered by physiologists, but it is not my object to discuss them here. I will simply endeavour to give the actual state of our information on this subject, as deduced from the experiments detailed in this essay, and others which are generally received and acknowledged.

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[1] For a full exposition of these facts, the reader is referred to Bernard's "Leçons sur des Substances Toxiques et Medicamenteuses," and the "Physiologie et Pathologie du Système Nerveux."

1. The heart possesses in its own fibres the property of intermittent contraction, and the stimulus of the blood passing continually through its cavities regulates to a certain extent its movements. This is shown by experiments in the section on the "Cause of the Rhythmical Contraction of the Heart." Numerous observations on the heart, after section of both pneumogastrics in the neck, show that these nerves further regulate the heart's action; for when their influence is cut off, the pulsations of the organ become rapid and feeble. This is shown in Expt. XIX., where the pneumogastrics were divided in the neck, increasing the rapidity of the heart's action, but diminishing the force of its contractions, as indicated by the cardiometer. Many instances of palpitation of the heart may undoubtedly be referred to a deficiency in proper innervation transmitted to it through the pneumogastrics; for most of them may be referred to derangements of the nervous system, and frequently these derangements have their origin either in the lungs, from the individual being put "out of breath" by exercise, or, in the stomach, from indigestion; both, organs which are abundantly supplied with filaments from the pneumogastric nerves. The phenomena which accompany palpitation of the heart are precisely those which are produced by section of those nerves.

2. When we galvanize the pneumogastrics in the neck, the galvanic current is not conducted by the nerves to the heart, but we imitate, by means of galvanism, the ordinary "nervous force," an irritation from which is conveyed to the muscular fibres of the heart. It is difficult, when the irritability of the pneumogastrics is unaffected, to regulate the stimulus so as to observe the effects of slight action of these nerves upon the heart, its muscular fibres being extremely sensitive to irritation of any kind; but by the action of woorara, when it only partially paralyzes the nerves, as in the alligator, or in the dogs used in Expts. XXV. and XXVI., we can determine that a slight stimulus diminishes the frequency but increases the power of the contractions of the heart; but a powerful stimulus paralyzes the fibres so long as it be kept up. Expts. XIX. and XX. show that when the number of the pulsations of the heart is diminished, their force is increased. If we apply the galvanism directly to the heart, we can equally paralyze its fibres; and in this instance, if the current be sufficiently powerful, this is permanent, and we have no more regular contractions of the organ. The heart, like other organs, is subject to various changes in its nutrition, and if it were not under the control of, and regulated by, the pneumogastric nerves, would be subject to variations in its action which would seriously affect the general system. A certain amount of nervous force, like the "muscular sense" which produces tonicity of the muscular system, is continually supplied to it by the cerebro-spinal system, which regulates and moderates its action; it can be

closely imitated by electricity or galvanism; a slight current merely moderates the action of the heart, but a powerful current, which represents the force in an intensely exaggerated form, arrests its action completely. We cannot be surprised that an organ which possesses such peculiarity in the properties of its muscular structure, and the proper action of which is so important to the well-being and the life of the animal, should be thus under the dominion of, and guarded by, the nervous system. There are instances on record of immediate death by stoppage of the heart from fright, anger, grief, and other severe mental emotions which operate powerfully on the nervous system. Syncope from these causes is by no means uncommon. In the latter instance, where the heart resumes its functions, the nervous shock carried along the pneumogastrics has been sufficient only to temporarily arrest the action of the heart; in the former, when death is the result, the shock has been so great that the heart is unable to recover from its effects. Thus we explain no phenomenon in physiology, however impractical it seem at first, without finding a useful application in pathology.

Mechanism of the Closure of the Valves of the Heart.—The four ventricular orifices of the heart are furnished with valves which permit the blood to flow in only one direction. In some of the inferior animals the auricular orifices, by which the blood passes from the veins into the heart, are provided with a valvular apparatus. This is the case in fishes; but in animals which have a double heart, and in man, the openings of the great veins into the right auricle, and of the pulmonary vein into the left auricle, are provided with no valvular apparatus. These orifices are narrowed, however, by the contraction of the fibres during the auricular systole, moderating, though not entirely preventing, regurgitation; while the play of the auriculo-ventricular valves permits the blood to flow freely in and fill the ventricles. The ventricles then contract powerfully, close the auriculo-ventricular valves, force open the semilunar valves, and project the blood, on the one side, into the pulmonary artery, and on the other into the aorta; from whence it is immediately prevented from regurgitating by the closing of the aortic and pulmonary valves. Thus the blood, forced into the right auricle from the veins of the system, moves but in one direction, towards the aorta, and is prevented from taking a backward course by the valves which protect the orifices of both ventricles. It is correctly stated by physiological writers that the tricuspid valves, unlike the mitral, do not entirely close the right auriculo-ventricular orifice. This may be observed by a very simple experiment. If we take the fresh heart of any animal, the bullock, for example, cut away the left auricle, and force water into the ventricle with a syringe introduced into the aorta, the aortic valves being previously destroyed, it will be seen that the mitral valve effectually prevents the egress of the water through the auriculo-ventricular opening; and that these valves, the action of which may thus be beautifully exhibited, are closely and effectually coadapted by the pressure exerted against them. But if an analogous experiment be performed upon the right side of the heart, cutting away the right auricle so as to expose the tricuspid valves, and injecting fluid against them through the pulmonary artery, it will be seen that a certain amount of regurgitation takes place, and that these valves do not effectually close the auriculo-ventricular orifices. Mr. T. King, in an essay published in *Guy's Hospital Reports* for 1837, pointed out the peculiarity of action of the tricuspid valves, and called it the "safety-valve function of the right ventricle." He stated that it was a provision to prevent congestion of the lungs when anything occurred to obstruct the pulmonary circulation; and it is evident that by this means we have the delicate tissue of the lungs, in which congestion cannot be relieved by anastomoses, as in the general circulation, protected from injurious accumulation or pressure of blood. The difference between the action of these valves on the two sides of the heart I have repeatedly verified, and it can be easily demonstrated in the manner just described.

But the next question which presents itself is: By what means are the valves of the heart made to close? This question may easily be answered with regard to the semilunar valves. The blood circulates in the arterial system under a pressure which will support a column of about six feet of water, or six inches of mercury. During the flow of blood from the ventricle into the aorta, the power of the heart overcomes this pressure, and opens the valves; but when the force of the heart is taken off, the valves are closed, effectually preventing regurgitation. We would naturally suppose that the auriculo-ventricular valves were closed in the same way, by backward pressure; and this indeed is the general opinion among physiologists; but, in 1843, Dr. Baumgarten, a German physiologist, endeavoured to prove by experiment that these valves were closed by a current in another direction, attributing it to a contraction of the auricles, and not the action of the ventricles. I do not know that this view has met with much favour among physiologists, but some have confirmed his experiments, and the explanation has been adopted by Milne-Edwards[1] and a few others. The experiments upon which this view is based are briefly these:—

The heart of a large warm-blooded animal is prepared by completely removing the auricles, so as to expose the auriculo-ventricular valves. It is then held in a vertical position, the valves lying in the cavity of the ventricles, leaving the orifice patent. If water be poured slowly into one of the ventricles through this opening, the valves will gradually float out and their edges approximate; then, when the ventricle is nearly filled, if the stream be suddenly increased in power, the valves completely close.

The facts here stated are entirely correct, and I have repeatedly verified them; but if, as before stated, a stream of water be forced *against* the valves, the orifice is closed. We cannot, therefore, reason from the experiments of Baumgarten that this is the natural mechanism of the closure of the valves, but must examine closely into the conditions as they exist in the normal condition of the organ. For that purpose, and with the object of settling this question, if possible, I carefully repeated the experiments of Baumgarten, and carried his observations a little further.

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[1] Milne Edwards, "Leçons sur la Physiologie et l'Anatomie comparée de l'Homme et des Animaux," tome iv. page 30.

Expt. XXVII. Jan. 30, 1861.—In this experiment I found that the mitral valves were closed when the current of water poured into the ventricle flowed in a small stream; and in this case it is evident that they were closed by backward pressure, for the current of water, flowing thus, on a bullock's heart prepared in the manner above described, did not exert pressure upon the whole of the auricular face of the valves, but merely made a small opening for itself between them. I then employed a larger stream, and in this instance the valves were overpowered, and the water flowed in a full stream from the aorta. The aortic opening was then closed, and regurgitation took place freely at the auriculo-ventricular orifice. In this modification of the experiment, however, the force of the water was considerably greater than that of the natural current of blood; it was impossible, indeed, to graduate this, and to pour the fluid into the ventricle in a stream which would impinge upon the entire surface of the valves which did not flow with a great deal of force. These facts were repeatedly verified in this, and confirmatory experiments, which it is unnecessary to detail here.

Let us now examine the pressure of the blood in the cavities of the heart during circulation; for it is evident that when the auricle is entirely removed, and water is poured from a height into the ventricle, we are far from fulfilling the natural conditions, which it is so necessary to observe in all physiological observations. During the circulation, the veins, heart, and arteries are completely filled with blood; no air or gas can exist, except in solution, in the circulatory system; and especially in the heart does the presence of any gaseous fluid disturb the circulatory function. The blood also circulates under a certain pressure; and a certain force is exerted by the heart at every pulsation. In the arterial system the pressure of the blood is represented by a column of six inches of mercury. This pressure is constant in the arteries, but intermittent in the heart. In the heart the pressure is null during the diastole, as has been shown by actual experiment,[1] but nearly one-third greater than the arterial pressure during its systole. In the venous system the pressure is much less constant than in the arterial; it is always less, and subject to numerous variations. Bernard found the arterial pressure in the carotid of the horse, measured by his cardiometer, to be 110 millimetres; at each cardiac pulsation it was increased to 175.[2] In another horse he found the pressure in the jugular to vary between 105, 100, 95, and 90 millimetres.[3] The pressure exerted by the contraction of the auricles has never been ascertained. Though it adds something to the venous pressure, it cannot be very considerable. Under these circumstances, during the diastole of the ventricles, the venous pressure operates upon the auricular face of the auriculo-ventricular valves, it has no cardiac pressure to oppose it, and the orifice is kept patent. The same is true during the contraction of the auricles, the pressure is thereby increased, it is exerted by a column of blood which impinges upon the entire surface of the valves, and the ventricles are thus completely filled. During this time the blood is prevented from regurgitating from the aorta and pulmonary artery by the semilunar valves which are closed by the arterial pressure. But when the ventricles act, they exert a force sufficient to overcome the arterial pressure, which keeps the semilunar valves closed; and they close at the same time the auriculo-ventricular valves, producing one element of the first sound of the heart. The systole of the ventricles ceases; its pressure is taken off; the arterial pressure closes the semilunar valves, producing the second sound; the venous pressure opens the auriculo-ventricular valves, and keeps the orifice patent, until the succeeding contraction of the ventricles. Thus it is that the cardiac pressure, intermittent and operating during the systole of that organ, being superior to the arterial and venous pressure, at the same time opens the semilunar, and closes the auriculo-ventricular valves.

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[1] Bernard, "Leçons sur les Propriétés Physiologiques et les Alterations Pathologiques des Liquides de l'Organisme," tome i. page 173.

[2] Bernard op. cit., page 172.

[3] Bernard, *op. cit.*, page 203.

Inasmuch as Baumgarten's experiments showed that the auriculo-ventricular valves, which are closed by means of a backward pressure during the systole of the ventricles, can be closed by pouring a stream of water into the ventricles from the auricles, it occurred to me to extend these observations to the aortic semilunar valves, and for this purpose I made the following experiment:—

Expt. XXVIII. Jan. 30, 1861.—A bullock's heart was prepared so as to exhibit the action of the aortic valves; which was done by cutting away a portion of the left ventricle so as to expose them to view, securing the nozzle of a large syringe in the aorta, and forcing water towards the ventricular cavity. The semilunar valves were thus closed, effectually preventing the passage of the fluid. While the nozzle was yet in the aorta, diminishing, but not preventing, the flow of fluid, water was poured from a considerable height into the vessel. The valves were at first floated out, and then closed in the same manner as in Experiment XXVII., on the mitral valves. This observation was repeatedly verified.

This last experiment would go as much to prove that the semilunar valves are closed by a current from the ventricle into the aorta, as the preceding one does that the current from the auricle to the ventricle closes the mitral valves; yet, I will venture to assert, no one could entertain, for a moment, the view that the force which overcomes the resistance of the aortic valves, by operating from the ventricles, closes them by the same current. The experiment, of course, proves nothing with regard to the action of the valves at the aortic orifice, but it shows the falsity of conclusions, drawn from experiments, in which natural conditions are so utterly disregarded, as in those which favour the idea that valves arranged for the purpose of permitting the flow of blood in one direction, and preventing reflux, are closed by the opposite current.[1]

Seat of the Sensation of the "Besoin de Respirer," which gives rise to the Movements of Respiration.—The circulation of the blood is intimately connected with the function of respiration. In health the number of pulsations of the heart bears a definite relation to the number of the respiratory movements; when the pulse is increased in frequency, we breathe more rapidly; and when the heart labors, as in cases of advanced disease of this organ, the patient experiences a sense of suffocation which is not dependent upon the condition of the respiratory organs. What gives rise to this sense of suffocation? Why is it, when the lungs are unaffected, when a large supply of pure air is taken in at every respiratory act, that a sense of suffocation attends imperfect action of the heart? These are questions which are of vital interest to the pathologist; but they cannot be answered unless we ascertain the seat of sensation of want of air, which ordinarily is not perceived by the brain, but insensibly induces respiratory movements; but when circulation or respiration is much disturbed, gives rise to the distressing sensation of suffocation. To resolve these questions, which are as yet imperfectly and incorrectly answered by physiologists, is the object of this division of the present paper.

Respiration is considered to be a reflex function, in which a certain impression is conveyed to the respiratory centre, and is followed by the action of the respiratory muscles. This is partly under control of the will; but under ordinary circumstances is involuntary. It is unnecessary to enter into any discussion with regard to the location of the respiratory centre. Physiologists now agree that it is situated in the medulla oblongata, at about the origin of the pneumogastric nerves. Almost the same unanimity exists with regard to the localization of the impression which gives rise to the respiratory act; attributing it to the impression made upon filaments of the pneumogastric nerves by the carbonic acid in the smallest lung cells. This is the view which was advanced by Marshall Hall, and which is now generally adopted. But there are difficulties in the way of explaining all the phenomena which we observe in health and disease by this supposition. In diseases of the heart, we may have dyspnœa, and yet the air be rapidly and effectually changed in the lungs. The evolution of a large amount of carbonic acid by the lungs, if it be promptly exhaled, does not produce dyspnœa. And in experiments upon the lower animals, which are to be mentioned hereafter, phenomena are developed, for which such an explanation will not suffice. There are some physiologists, indeed, who do not accept this explanation of Marshall Hall; among them are Bérard, who locates the sense of want of air in the heart;[1] John Reid, who thought that the respiratory movements were due to the action of the black blood upon the medulla oblongata; Volkmann and Vierordt, who thought that these movements were reflex, and due to the excitation of the general sensory system of nerves by venous blood. But this is a question which may be settled by direct experiment, and that is the mode in which it is to be considered here.

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[1] Since this paper has been written, the author has seen a short article on the method and time of closure of the auriculo-ventricular valves, by Dr. Halford, but the experiments seem to prove nothing beyond those here mentioned, being, indeed, little more than repetitions of them.

If a dog be rendered insensible by ether, and the chest be opened, artificial respiration being kept up by a pair of bellows, he will make no respiratory movements so long as respiration is carried on artificially; but soon after we stop this, the diaphragm, intercostals, and other respiratory muscles, which are actually denuded and exposed to our view, will be seen to contract violently, this contraction, or effort at respiration, ceasing so soon as the artificial respiration be resumed.

An experiment analogons to this was performed in 1664, by Robert Hook, in which he demonstrated that respiratory efforts ceased in an animal so long as the requisite quantity of air was supplied to the lungs. In this experiment, he made an opening into the pleural cavity and the lungs of a living dog, and forced a current of air through the trachea and out at the artificial opening. So long as the current was continued, the animal remained quiet; but when it was interrupted, he made efforts at respiration. This experiment is made use of by Marshall Hall, to support his doctrine of the reflex character of respiration, the excitation coming from the lungs; for he says that so long as fresh air was supplied to the lungs, there was no stimulus for respiration, and therefore no efforts were made; but when this current ceased, or when carbonic acid was substituted for atmospheric air, the contact of the carbonic acid, which, in the one instance, was exhaled by the venous blood, and in the other was introduced into the lungs, produced the excitation which was necessary to the respiratory act. This, however, is but a superficial view of these phenomena. We must examine into the condition of the heart, and rest of the circulatory system. We know how the heart's action is dependent upon respiration, and how an arrest of the interchange of gases in the lungs is immediately felt by the circulation. It was for the purpose of observing these conditions that the following experiments were instituted.

Expt. XXIX. Feb. 16, 1861.—A medium-sized dog was etherized, and the heart and lungs exposed in the usual way. A pair of bellows was introduced into the trachea and artificial respiration kept up. As long as this was performed, the animal made no efforts at respiration, even after he had almost recovered from the effects of the anæsthetic; but when the artificial respiration was stopped, he soon began to make efforts to breathe, as demonstrated by contractions of the diaphragm and intercostals, which were exposed to view. The femoral artery was then isolated and divided, a ligature applied to the distal end, and the cardiac compressed with the fingers so that the blood could be permitted to flow at will. A small stream was then allowed to escape, which was of the brilliant red colour of arterial blood; the animal remaining quiet and respiration being kept up actively. *Respiration was now stopped, and the animal remained quiet until the blood became dark in the exposed artery. He then, and not until then, began to make efforts at respiration. Respiration was now resumed and the blood gradually became red. The animal continued to make efforts at respiration, till the blood became red in the artery.* This observation was frequently repeated, and the above phenomena were invariable. Since that time, also, I have repeated the experiment upon other animals, always with the same result.

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[1] Bérard, Cours de Physiologie, tome iii. p. 523.

Expt. XXX. Feb. 19, 1861.—A good sized dog was poisoned with woorara, and the chest opened in the usual way. When the animal came fully under the influence of the poison, he ceased all respiratory movements. Artificial respiration, however, was kept up for three hours; and in about two and a half hours, he had so far recovered from the effects of the poison as to make efforts at breathing when artificial respiration was interrupted. The femoral artery was then opened and divided as in the former experiment. *When respiration was arrested the animal made efforts to breathe, but only when the blood became dark in the artery, and ceased these efforts when it became red again on resuming respiration.* This observation was made repeatedly.[1]

Expt. XXXI. Feb. 15, 1861.—In a large dog, under the influence of ether, in which the heart was beating regularly, the organ was suddenly cut from the chest. The animal afterwards made several respiratory movements. In this instance the "*besoin de respirer*" could not be derived from the heart, as it had been removed from all connection with the system.

Expt. XXXII. Mar. 11, 1861.—A good sized dog was etherized and the heart exposed in the usual way. Artificial respiration was actively kept up, and while the heart was pulsating regularly and vigorously, it was cut from the chest by a single sweep of the knife. The lungs were still regularly inflated, *but in thirty seconds the animal commenced to make efforts at respiration, which were continued for two and a quarter minutes.* These efforts were powerful and convulsive.

It would seem settled by these experiments, that the "*besoin de respirer*" which is conducted to the respiratory centre, and excites the movements of respiration, is not located in the lungs, nor in the heart, but in the general system; and the sense of suffocation is due to the presence of black or venous blood in tissues which should be supplied with arterial blood. We would therefore expect that this peculiar sensation would, if it resided in the general system, be conveyed to the nervous centres by the ordinary sensory nerves, and not by the pneumogastric, as was supposed by Marshall Hall. This, indeed, is the fact, and it can easily be proved by the following experiment:—

Expt. XXXIII. Feb. 15, 1861.—A medium-sized dog was etherized, and the heart and lungs exposed in the usual way. The occurrence of respiratory efforts when the blood became black in the arteries, and their cessation as soon as it regained its red colour, was noted. The pneumogastric nerves were then isolated in the neck and divided, producing the usual effect upon the movements of the heart. The experiments of arresting artificial respiration and exciting respiratory efforts on the part of the animal, were then repeated with precisely the same effect as before division of the pneumogastrics, and as observed in other experiments.

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[1] This experiment has additional interest as confirming the well known experiments of Brodie, in which he demonstrated, that in poisoning by certain substances, their effects will pass off, if artificial respiration be continued for a certain length of time. Among these poisons are woorara and opium. Of course, in this instance, it would have been impossible to preserve the life of the animal, after the chest had been opened and the thoracic organs exposed, but he evidently recovered considerably from the effects of the poison.

Though we have located the sensation which induces respiration in the tissues, and shown that it does not reside in the organs of respiration themselves, we have not arrived at the cause of this sensation. The venous blood either irritates the system from the presence of elements which are not contained in the same proportion in arterial blood; or the tissues feel the want of some principle which the venous blood does not contain in sufficient quantity. The great difference between venous and arterial blood is in the quantity of oxygen which they contain. According to the latest experiments of Bernard with regard to the comparative quantity of oxygen in arterial and venous blood, it is shown that the arterial blood of a healthy dog contained 18.28 parts of oxygen for every hundred parts of blood; while venous blood contained only 8.42 parts of oxygen per hundred.[1] In these experiments, Bernard found that when the gas was estimated by displacement with hydrogen or nitrogen, it became diminished if it were allowed to stand a few hours, and that part of the oxygen became united with carbon to form carbonic acid. He employed the oxide of carbon as a displacing agent, which prevented this change, and hence the large proportion of oxygen which he found in both varieties of blood. The usual estimates are based upon the experiments of Magnus, and indicate in the arterial blood of five animals (three horses and two calves) separately examined, a mean of 2.44 per cent. of oxygen for arterial, and 1.15 per cent. for venous blood; an estimate very far short of the truth. The venous blood is supposed by Brown-Séquard and others to be an active stimulant to the tissues on account of its irritating properties; but when we examine the arterial blood and find that it contains such a large proportion of oxygen, which we know is indispensable to the system, and is contained in small quantity in the non-arterialized blood, our immediate inquiry is, as to whether the excitation in question be due to the stimulating properties of the venous blood, or the want of oxygen in the tissues, which can be supplied only by arterial blood. This question I conceive can be settled by experiment. An animal does not feel the "*besoin de respirer*" while artificial respiration is kept up actively; but he does soon after this process is interrupted. In this case, partially oxygenated blood circulates in the arteries and is supplied to the systemic capillaries. If it be that the tissues simply need oxygen, any cause which would prevent oxygen from coming in contact with them would give rise to respiratory movements, though there were no black blood in the arteries, and though an abundant supply of fresh air were kept up to the lungs. The following experiment bears upon this point.

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[1] Bernard, "Leçons sur les Propriétés Physiologiques, et les Altérations Pathologiques des Liquides de l'Organisme," tome i. p. 367.

Expt. XXXIV. Feb. 19, 1861.—A good sized dog was etherized and the chest opened in the usual way. Artificial respiration was established and Expt. XXIX. verified. The blood was then allowed to flow freely from the femoral artery, while artificial respiration was actively continued. While the blood continued to flow, the respiratory muscles were carefully observed. During the first part of the bleeding no respiratory efforts took place; *but when the blood had flowed for a considerable time, and the system was becoming drained, respiratory efforts commenced, feeble at first, but as the bleeding continued, becoming more violent until the whole muscular system was affected by convulsive movements.*

This experiment is one of exceeding interest and importance. By the withdrawal of blood while respiration was active, the tissues were deprived of oxygen from a diminution in the quantity of blood, and relieved from the stimulation of the black blood, if it have any stimulating properties, for all the blood which goes to the capillaries is of a pure arterial character. No stimulation, then, is applied to the tissues; they simply are deprived of their normal supply of oxygen by a diminution of the oxygen-carrying fluid. This gives rise to the "*besoin de respirer*" first to a slight extent, but as the hemorrhage continues, increasing in intensity till the whole muscular system is convulsed from the overpowering sense of suffocation; a sense which we imagine we feel in the lungs, but really resides in the general system.

These experiments give us a new view of the "*besoin de respirer*" which gives rise to the respiratory movements, and of the sense of suffocation which is incident to the interruption of these movements. More and more as we advance in our knowledge of the functions of the body, do we take away certain sensations which we have been accustomed to perceive in special organs, and locate them in the general system.

In treating of the sensation now under consideration we are led to compare it with various others with which we are familiar. The system needs periodical rest; it is undergoing an incessant waste which must be supplied by food—a continual loss of fluid which must be supplied by water; and needs a constant supply of oxygen which is furnished by respiration. These are wants of the general system; but we refer their indications to particular parts. Drowsiness is indicated by drooping of the eyelids; hunger by uneasiness in the stomach; thirst by dryness of the mouth and fauces; and the "*besoin de respirer*," and sense of suffocation, when respiration is interfered with, is referred to the lungs. But the sensation of hunger does not reside in the stomach, though it may be momentarily arrested by the introduction of substances, even of an indigestible character, into its cavity. When we observe a patient suffering from any disease which is characterized by deficient digestion and assimilation, while the system is capable of feeling the want of nourishment, an abnormal appetite is a characteristic symptom; and the hunger is not appeased for any length of time by the introduction of food into the stomach. This, as is well known to practical physicians, is a frequent symptom of diabetes and chronic diarrhœa. Direct experiments have been made upon the sensation of thirst. Magendie and Bernard have kept an animal (a horse) without water for twenty-four or forty-eight hours, divided the œsophagus so as to divert food and water from the stomach, and then allowed him to drink. As fast as the water was swallowed it flowed out at the wound; and though the mouth and fauces were moistened, the thirst was not satisfied and the animal continued to drink. Bernard has made analogous experiments with dogs in which he had established gastric fistulæ. These experiments I have frequently repeated, and as they are very striking and easy of execution, I report an example:—

Expt. XXXV. Nov. 17. 1860.—A dog which had been operated upon for the establishment of a gastric fistula two days before, was kept without water for twenty-four hours. At the time of the experiment he was quite lively, having suffered little from the operation. The cork was then removed from the tube in the stomach, and the animal was allowed to drink. He drank until he desisted from actual fatigue, and after resting for a moment drank again in the same way, the fluid all this time flowing freely from the fistula. This was repeated several times until the animal gave up the effort in despair. The cork was then replaced in the tube, and when the animal drank, his thirst was soon satisfied.

These experiments, which are well known to physiologists, show that thirst is a sensation felt in the tissues, but referred to the mouth and fauces; and that though these, and the walls of the stomach, be continually moistened, the thirst is not appeased; nor can it be until the fluid has been taken into the bloodvessels and circulates in the system. This want of fluid is always manifested by animals after the withdrawal of blood. I have repeatedly observed animals from which I had removed blood by the jugulars go to the water and drink copiously as soon as they were set at liberty.

Conclusions.—Respiration is a reflex phenomenon, under ordinary circumstances, and movements connected with it are due to an impression conveyed from the general system to the medulla oblongata, whence a stimulus is sent out which animates the respiratory muscles. While respiration is carried on effectually, without exertion to an animal, as in artificial respiration, evidently no impression is made upon the respiratory centre, for no movements take place.

The impression which excites respiratory action is received from the tissues and not from the lungs; for it is only when dark blood, instead of red, is supplied to the tissues, that we have the impression conveyed to the respiratory centre, producing efforts at respiration.

This impression is not transmitted through the pneumogastric nerves, but through the general sensory nerves; for there is no difference in the manifestation of respiratory movements when the supply of air to the lungs is cut off, if both pneumogastrics be divided.

This impression is due to the want of oxygen in the tissues, and not to stimulating properties of the venous blood; for when the supply of oxygen is cut off by abstracting blood from the system, the phenomena which we noticed as occurring during interruption of respiration are marked, though air be supplied in abundance to the lungs.

This impression is not due to distension of the cavities of the heart, as suggested by Bérard; because the heart may suddenly be removed from the body of a living animal, and the respiratory efforts will occur as in the case of abstraction of blood.

This impression (the sense of want of air, "*besoin de respirer*") when exaggerated constitutes the sense of suffocation; and it, like the sense of fatigue, of hunger, and of thirst, has its usual source in the general system, though it manifests itself to us in the lungs in the same way that we have fatigue affecting the eyelids, hunger the stomach, and thirst the mouth and fauces. They are all indications of wants of the system, and cannot be effectually relieved by the local effects of anything upon the organs to which they are referred by our sensations.

The necessity for respiration, or for oxygen, then, exists in the tissues; and asphyxia cannot be solely applied to arrest of the function of the lungs, but to anything which interferes with the consumption of oxygen by the system. Anything which operates in this way gives rise to a sense of suffocation, and consequently to general convulsions, if it be carried sufficiently far. We can thus explain various pathological phenomena which would otherwise be obscure. The operation of simple asphyxia by tying the trachea, or preventing air from gaining entrance into the lungs, induces the sense of suffocation which first gives rise to respiratory efforts more violent than ordinary, and subsequently to general convulsions. We are all familiar with these phenomena, however they may be explained.

In the poisoning by oxide of carbon we have general convulsions which arise from the sense of suffocation; for this agent so operates upon the blood-globules, that though they continue red, they are rendered incapable of performing their function of supplying oxygen to the system.

In poisoning by hydrocyanic acid, when the system is not immediately overpowered by this agent, and the muscular irritability destroyed, the blood becomes incapable of supplying oxygen to the system, and convulsions ensue as the result of the sense of suffocation.

In death by hemorrhage, convulsions, occurring just before death, are invariable. This is also the result of deficient supply of oxygen to the tissues, and the sense of suffocation is the starting point. This was demonstrated in Expt. XXXIV., in which the animal was bled to death.[1]

Finally, in all cases where the supply of oxygen is cut off, not from the lungs, but from the tissues, a sense of suffocation is the result, and convulsions ensue following upon violent efforts at respiration.

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[1] These convulsions have been explained in various ways by physiologists, but never satisfactorily, though they have long been noticed.

Résumé.—In the foregoing essay, I conceive that I have established the following facts, which are either not generally admitted or not understood by physiologists:—

First. That the heart elongates during the systole of its ventricles.

Second. That the cause of the rhythmical contraction of the muscular fibres of the heart is resident in the fibres themselves, is one of their inherent properties, and remains so long as they retain their "irritability." That it is derived neither from the cerebro-spinal nor sympathetic system of nerves.

Third. That the natural stimulus which excites the regular and effectual movements of the heart, is the blood, and that this cannot be replaced by a fluid of less density.

Fourth. That though the flow of blood in the cavities of the heart is sufficient to induce, under ordinary circumstances, regular contractions of the organ, still it is necessary that these movements be further regulated and controlled; and that this is effected through the agency of the pneumogastric nerves.

Fifth. That the action of the heart may be arrested, through the motor filaments of the pneumogastric nerves, by means of galvanism; that this does not take place in animals poisoned by woorara, on account of the paralysis of the motor nerves. That the motor filaments of the pneumogastrics are the last which are affected by this agent, and that in the alligator they are left almost intact. That the cause of the arrest of the heart by galvanization of the pneumogastrics is the exaggeration of the force which regulates the action of the heart, rendering it slower and more powerful.

Sixth. That in asphyxia, the cause of the arrest of the action of the heart is over-distension of its cavities; and that anything which brings about a sufficient amount of distension will equally arrest the action of this organ.

Seventh. That the auriculo-ventricular valves are closed by a backward pressure operating during the contraction of the ventricles, and not by the current of blood from the auricles to the ventricles.

Eighth. That the excitation which gives rise to the reflex phenomena of respiration is received from the general system, and not from the lungs or heart. That this excitation is due to the want of oxygen in the tissues, and not to stimulating properties in the venous blood. That the exaggeration of this excitation constitutes the sense of suffocation, and gives rise, if excessive, to general convulsions.

APPENDIX. *Some Points in the Anatomy of the Circulatory System of the Crocodilus Mississippiensis, or Alligator.*—The anatomy of the alligator is imperfectly, and, in many respects, incorrectly described in most works upon Natural History. The description of the circulatory apparatus, however, given by Milne Edwards,[1] in his great work on *Physiology*

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[1] For a full description of the circulatory system of the alligator, see Milne Edwards, "Leçons sur la Physiologie," etc., tome iii. p. 424 et seq.

and the Comparative Anatomy of Man and the Inferior Animals, now in course of publication, is very accurate; and as the arrangement of the heart and larger vessels is very peculiar in this animal, differing, indeed, from any other of which we have any description, I have thought that a sketch of these peculiarities might not be uninteresting.

The heart is quite small in proportion to the size of the animal; and, like the organ in reptiles generally, the ventricular portion is small in proportion to the size of the auricles. The position, shape, etc., of the auricles do not differ from those of other reptiles; except that the right auricle is much larger than the left; but when we examine the ventricular portion, we find that it is divided by a complete septum into two chambers, a right and a left ventricle, like the heart of a warm-blooded animal. From the ventricles arise the aortæ; one from the left, and one from the right side; we also have a pulmonary artery going to the lungs from the right ventricle. The right aorta passes immediately over to the left side, and, as it carries venous blood, may be called the venous aorta; while the left, or arterial aorta passes directly over to the right side. There is no communication between either auricles or ventricles upon the two sides; but at the commencement of the two aortæ is an opening which permits an admixture of the venous and arterial blood to a limited extent. This is called the foramen of Pinazza, because its discovery was erroneously supposed to belong to him. It was really described by Hentz, an American anatomist, in 1824, in a paper published in the *Transactions of the American Philosophical Society;* while Pinazza described it in 1833. Following out now the distribution, etc., of these two aortæ, we have the arterial aorta first giving off a large branch, the brachio-cephalic, which almost immediately gives off the left subclavian, going to the left superior extremity. The brachio-cephalic divides into the left subclavian, already mentioned, and a single carotid artery which goes in the median line to the base of the skull, there divides into two vessels, which soon bifurcate and form the external and internal carotids of the two sides; the internal going to the encephalon, and the external to the muscles, etc., about the head. Next is given off the right subclavian artery distributed to the right superior extremity. Each subclavian artery, a short distance from its origin, gives off a small cervical artery which goes to the head, and is accompanied by the jugular vein and the pneumogastric nerve. It is by being found with these vessels that we recognize this nerve. These are the principal branches which are given off by the arterial aorta alone. The venous aorta gives off no branches in the neck, but passes back to the vertebral column, anastomoses by a branch of considerable size with the arterial aorta, and sends a branch, larger even than the anastomosing branch, to some of the abdominal viscera, which are thus supplied with venous blood. The dorsal aorta is formed by the union of the arterial aorta, and the anastomosing branch of the venous aorta, and thus carries mixed blood; it passes down the back, gives off in its course the intercostals, the anterior mesenteric, the renal arteries, the vessels of the posterior limbs, the posterior mesenteric, and finally is distributed to the tail.

The distribution of the blood in this animal is very singular. The fore-legs, the head, and face, are supplied with almost pure arterial blood, as the communication by the foramen of Pinazza is very imperfect. There is but a single carotid artery in the neck, and the pneumogastric nerves are found accompanying the cervical arteries which are given off by the subclavians. Part of the abdominal viscera, the stomach, liver, spleen, etc., are supplied with venous blood. The kidneys, intestines, hind legs, and tail are supplied with a mixture of arterial and venous blood.[1]

The length of time for which the nervous and muscular irritability of these animals is retained after death, renders them very valuable in many physiological experiments. I have found that, when poisoned with woorara, this irritability persisted for days. For a considerable time, four or five days after death, even when the weather was quite warm, no decomposition took place. I do not know that this apparently antiseptic property of woorara has ever been remarked, but it certainly seemed to retard decomposition in the alligators I have experimented upon.

Art. IV.—*On the Formation of Knots on the Umbilical Cord.* Read before the Obstetrical Society of Boston, May 4, 1861. By William Read, M. D., formerly Physician to the Boston Lying-in Hospital. (With eight wood-cuts.)

Obstetric writers, with very few exceptions, have attributed the formation of the knots which are occasionally found on the umbilical cord, at birth, to a change in position of the fœtus while in the uterus. This may take place either from its own movements, or from some movement communicated to it by the mother. In this way, passing through a loop of the cord, it forms the knot, which may be tightened by the further gyrations of the fœtus, or remain loose till delivery. Practically the subject is of no importance. The very nature of the complication effectually prevents any measures to protect the fœtus from the dangers which may arise if the knot should tighten. But while granting all this, and admitting that nothing we can do will prevent their occurrence, it may be well to examine into the evidence upon which the general belief, as to their formation, is based; to determine whether it rests upon good foundation, or is one of those fallacies, so many of which, like the rubbish which disfigures the proportions of many a stately fabric, are to be found in the writings of obstetric authors, and which have been handed down from one generation to another, and passed current because they have never been questioned.

Smellie[2] states the fact of their occurrence, without attempting any explanation of their formation. Dr. R. Lee[3] says: "True knots are sometimes made by the fœtus upon its own umbilical cord, and it thereby unconsciously, if I may so express it, commits suicide by compressing the vessels. I have seen two instances of this, and in both the knots must have been tied before the labours commenced." Rigby[1] states that "the manner in which these knots are formed may be easily imagined, when by chance the cord lies in the form of a ring, and the fœtus happens to float through it, a noose is made, which, when drawn tight, by accident, forms a knot." Churchill[2] says of the funis: "Occasionally, owing to the movements of the child at an early period, it may be coiled round its neck, tied in knots, or escape below the head, so as to prolapse during labour." Montgomery[3] entertains the general belief of their formation while the fœtus is yet in utero. Prof. Miller[4] remarks that the coiling of the funis about the neck "affords the key to an explanation of these knots, at least when they are single. They are tied by the fœtus slipping through the circle about its neck." Levret[5] merely mentions the fact of their occurrence, and states that, when they do occur, "the infant ordinarily perishes before birth, or is born very much emaciated." Baudelocque[6] says: "They sometimes form themselves during pregnancy, and at an early date, but there are also cases where the cord does not knot itself, until the instant when the child issues from the womb of the mother." Mauriceau[7] mentions having delivered eight children with knots upon the funis of each, which he says were formed during the intra-uterine life of the child. Velpeau[8] remarks: "On some occasions they are real knots, either simple or complex; more frequently, however, they are doublings, vascular nooses, whether of arteries or of the veins; the former are met with particularly where the cord is very long, are owing to the movements of the fœtus, are effected in the same way as the twisting of the cord about the neck, limbs, or other parts of the child, frequently met with in parturition, and, it may be said, are but the definite result of this last mentioned disposition." Blundell[9] says: "To Dr. Hunter I may refer you for a very plausible explanation of the formation of these knots when single, for he has suggested that the umbilical cord, at birth, may, perhaps, form a coil round the margin of the os uteri within, and that the fœtus, in passing the orifice of the uterus, may at the same time pass through the loop, carrying the umbilical extremity of the cord along with it, so as to form a knot at the very moment when the body passes into the world. And this explanation enables us to understand well enough how a single knot may be formed; but then how is it that two or three knots are produced? how that a knot may be found on the cord in the earlier months, though the fœtus has never left the cavity of the uterus?" Prof. Meigs[10] explains their formation, by supposing that "if in its gyrations within the womb, the child should enter a coil of the navel-string, and, passing through it, should thus make a knot on the cord—that knot happening to be strongly drawn, might cause its death by hindering the complete return of the blood of the placenta." Cazeaux[1] says: "When the cord is very long, it very often shows one or more knots. Some of these are formed during pregnancy, and often at a very early date; but others are never formed except at the moment of delivery. They never can be drawn tight enough (during pregnancy) to compromise the life of the child, to whose movements they are certainly owing. But we can understand how the cord, shortened by its circumvolutions about the trunk or the neck, may find itself stretched with great force. The knots will then be drawn tight enough to interrupt the circulation entirely. If the labour is prolonged, the death of the child will be the result." Ramsbotham[2] says: "Sometimes the funis itself is found in labour to be twisted into a loose knot; but this appears to me to be produced rather by the movements of the fœtus in utero, than to exist as an original conformation." Davis[3] says: "We occasionally find a knot on the string, which in all probability, and in the greater number of cases, is found at the time of labour. It may, however, happen at any other time, in cases where there might be an excessive quantity of liquor amnii, as, for example, we find mentioned in Smellie's cases. Most frequently, however, this knotting takes place during labour; and it is very easy to conceive how this may happen. Let the cord be supposed to be lying in a coil round the orifice or neck of the womb; the head of the child having to pass in that direction, will find its way through it, and must necessarily draw it into a knot." Hunter[4] says: "If I have not been deceived, I have seen it twice." Rokitansky[5] says: "The true knots of the umbilical cord, that occur in rare cases, are of importance, as they may occasion obstacles to, or a cessation of, the circulation in consequence of the traction exerted upon them during parturition." The inference from this is, that he believed them to be formed during the intra-uterine life of the fœtus, or *before* the time of parturition.

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[1] The description of the heart and arteries, which is here given, is nearly, if not precisely, according to the views entertained by Dr. Bennett Dowler, of New Orleans, who has made such extensive researches into the anatomy and physiology of the alligator. These views, however, have never been fully published by him, but were verbally communicated to the writer.

[2] Coll. 19, No. 2, case 3.

[3] Mid., p. 124.

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[1] Mid., Chap. III.

[2] Mid., Am. ed., p. 181.

[3] Signs and Symptoms of Pregnancy, Am. ed., p. 541 et seq.

[4] Obstet., p. 151.

[5] Art. des Accouch., p. 305.

[6] Art. des Accouch., p. 518.

[7] Obs., p. 133.

[8] Transl., by Meigs, 4th Am. ed., p. 202.

[9] Ed. by Castle, p. 108.

[10] Obstet., 2d ed., p. 218.

They may be single, or double, or more than one on the same cord.

Usually when they occur, the cord is found free from any convolutions about the body of the child, but, in rare cases, where the cord is extraordinarily long, both these conditions have been noticed. Baudelocque[6] mentions a case where he found a triple knot on the cord, which was thirty-six or thirty-seven inches long, and moreover twice round the neck of the child. The position of the knot he estimated at about a foot from the umbilicus.

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[1] Accouch., 5th ed., Paris, 1856, p. 205.

[2] Process of Part., Am. ed., p. 82.

[3] Prin. and Pract. of Obstet. Med., p. 833.

[4] Anat. Descript. of the Gravid Uterus.

[5] Vol. ii. p. 350, Pub. of Sydenham Soc.

[6] Loc. sup. cit., § 521.

He also states that it was drawn as tight as any other knot could have been in like circumstances. The child was, however, born alive. Smellie (*loc. cit.*) mentions a case where the funis was "nine hand-breadths long, had a loose knot on it, and was twisted round the neck of the child, which was dead." Dr. Lee[1] instances a case where the knot was "ten inches from the umbilicus, and the cord also surrounded the neck of the child once." In this case the cord was much compressed where the knot was tied. Another is quoted by the same author, in which the cord was "atrophied between the knot and the umbilicus." "I have no doubt," says Dr. Lee, "these were both formed early in pregnancy." In both these cases, the context warrants the opinion that the children were dead. Dr. Coale[2] reports a case where there were two knots on the cord, about five inches apart, one of which was double, and the other single—the latter being nearest the placenta. Prof. D. H. Storer[3] mentions a case, quoted from a foreign journal, in which the "patient, seven or eight months advanced in pregnancy, being under a bed for some purpose, was suddenly surprised in that position, and hastily backing out, immediately had the symptoms of a dead child, of which she was delivered ten days after. A knot was found in the cord, so tightly drawn as to fully account for the death of the child by impeding the circulation." Dr. Zollickoffer[4] reports two cases, in both of which there was a knot on the funis, which was coiled about the neck and chest.

Knots may occur when the cord is comparatively short.

In a case of my own—Mrs. S., third pregnancy, April 24, 1860—I found a single knot on the cord, about midway its length. The child, a full-sized boy, was perfectly healthy and vigorous. The cord was twisted in both directions very strongly. To the right—the exceptional way—from the umbilicus to the knot; and to the left—the ordinary and most frequent direction—from that point to the placenta. The entire length of the cord was a little short of twenty-eight inches; exceeding the child's length by about six inches only. In another case, three weeks later than the preceding (May 13), the cord was thirty-three inches long, and the knot, which was first noticed lying loosely encircling the left ankle, tied back towards the umbilicus, so that when it was drawn tight by the tension brought on it in withdrawing the child from the mother, it was situated so near the umbilicus as to make it impossible to apply the ligature without untying it. This was also a simple knot. In another case still (Oct. 5, same year), the cord was fifty-four inches long, very firmly twisted, and as large as the forefinger, with a single knot, about the middle. The child was vigorous, weighed thirteen pounds, and its condition forbade the supposition of any diminution of nourishment by constriction of the cord.

By some writers much importance has been given to the complicity of the knots described. Montgomery,[1] in alluding to this point, says: "The formation of the single knot, as it is generally called, is not difficult to conceive; but there is one of a very curious kind, of which I have seen but two instances, and it is so complicated, and requires for its formation so much dexterity and management to imitate it, that I feel at a loss to understand how it could have been formed in utero." The knot referred to, is what is usually called the figure of 8 knot, and is the same as that to be seen in the specimen presented by Dr. Coale to the museum of the Medical College in this city. The knot figured by Baudelocque is still more complicated; a knot in this case having been tied on a knot. Dr. Lee, in commenting on this knot (*loc. cit.*), remarks: "Baudelocque gives a figure of a double knot on the cord. These appear to consist of two knots formed at different times. The fœtus must have passed twice through a large loop of the cord." By this opinion, adding his testimony to the impossibility of such a knot being tied at any other time, or in any other way.

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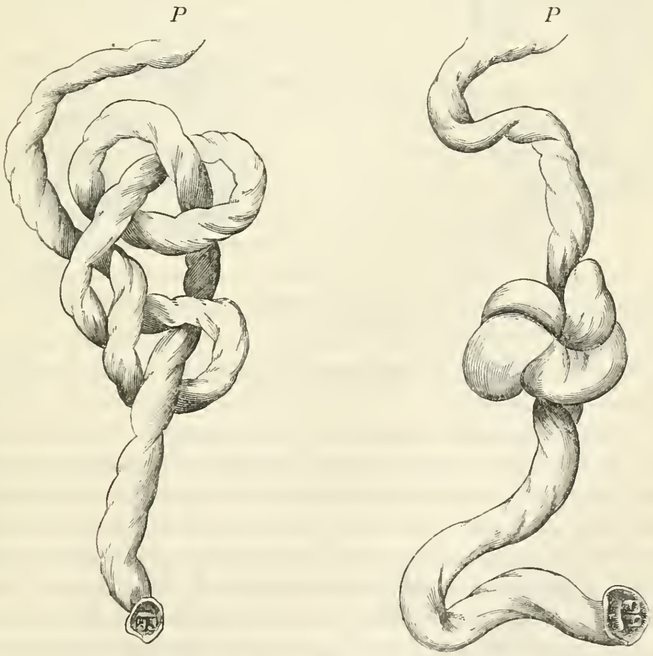
[1] Mid., p. 124.

[2] Records Bost. Soc. Med. Imp., vol. iii. p. 190.

[3] Ibid.

[4] Am. Journ. Med. Sci., July, 1841, p. 109.

Fig. 1. Fig. 2.



Baudelocque's Knot.—Fig. 1 represents the knot in its first stage of formation ; *P*, placental end Fig. 2, the knot as found at birth ; *P*, placental end.

Equal in complexity with this knot figured by Baudelocque, is a knot noticed by Dr. George H. Lyman, of this city, a figure of which is here given. In this case the cord was thirty inches long, and was round the neck and one of the arms of the child. The knot it will be seen is double; a knot being tied upon a knot, as one would tie a string twice in the same place.

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[1] Signs and Symptoms of Preg., loc. cit.

Fig. 3.

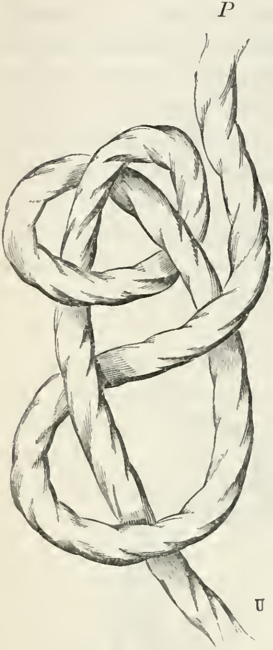


Fig. 4.

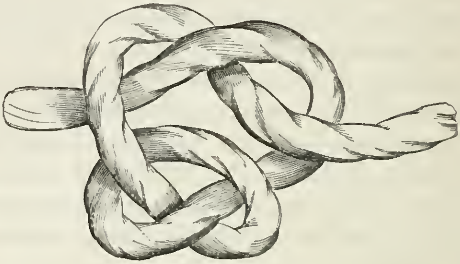
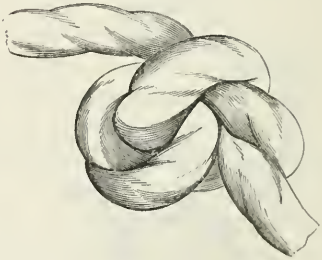


Fig. 5.



Dr. Lyman's Knot.—Fig. 3. Knot in the stage of formation; *P*, placental end. Fig. 4. Intermediate form. Fig. 5. Knot as it was found tied at birth.

The funis of one child, in twin cases, is sometimes found tied in a knot round that of the other.

Mr. William Newman reports a very interesting case of this kind in the *Edinburgh Monthly*.[1] In this case the children were contained in one bag of membranes, and were born at an interval of two and a half hours. The first was born alive, the second dead. "About midway between the umbilicus and the placental attachment of the funis, the cord of the first child, which was readily distinguishable by the ligature placed upon it, was tied in a single knot, and passing through the noose so formed, was the cord of the second child, which, on account of the tightness of the knot, was completely strangulated. With the exception of some flattening at this point, the cords presented a perfectly healthy appearance. The children were equally mature and well nourished, so that the circulation through the cords could not have been obstructed for any length of time before death. It has already been stated that the nurse, before my arrival, had exercised some force upon the cord of the first child, by drawing it downwards, from which I conclude that the constriction probably took place at that period." The length of these cords was about twenty-four inches each.

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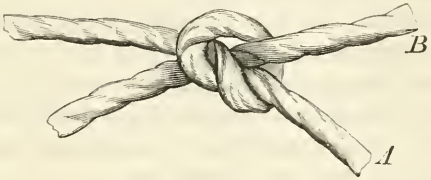
[1] July, 1858, p. 8.

The appearance of this knot on the cord is represented in Fig. 6, *A* being the cord of the first child, *B* of the second.

Fig. 6.



The knot figured by Mr. Newman who offers two solutions of its mechanism, makes no exception to the rule of formation proposed in this paper. "By the first, it may be supposed that at an early period of pregnancy the cord *A* must have been twisted into a single loop; through this loop the fœtus of cord *A* must have passed, and in place of going through it in part only (as when the cord encircles the neck in ordinary cases), it must have passed completely through; the noose still remaining so far loose as to permit the second fœtus with its cord *B* to drop through it.

"The second view may be that cord *A* may have made a single twist around cord *B*, the subsequent noosing of cord *A* being due to the formation of a knot upon it after it had already encircled cord *B*."[1]

The latter of these two explanations is incontestably the true one. The rotation of one child round the other, in a single sac of the membranes, without the necessity of any extraordinary movements, will bring its funis in such a relation to the other that all the conditions requisite for the formation of the knot will be then present, needing only the passage of the child through the loop thus formed, to complete and tie the knot at delivery. Complicated as the fact of the knot being tied round the funis of the other child, *apparently*, makes the case, in reality it is no more complex or incomprehensible, nor does it require any other conditions for its formation than are necessitated to tie a single knot alone.

As to the knot reported by Stein, which is quoted by Mr. Newman[2] and called a "real knot," no figure is given. The impossibility of imitating, on a cord, such a knot, without so much manipulation as seems to be forbidden by the circumscribed capacity of the uterus in such a case, induces a doubt whether the knot was so "real" as is reported. A half knot can be tied with the utmost ease—more easily even than when there is but a single cord—but a complete knot, in which both parts are perfect, as may easily be proved by experiment, is a difficult operation to succeed in.

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[1] Loc. cit.

[2] Mr. Newman, in addition to his own case, quotes a case from Siebold's *Lucina*, 1806, vol. iii. part 1, No. 144, p. 313, also of twins, "which had only reached the seventh month, and were putrid: they were inclosed in a common bag of membranes and had one placenta. Close to the placenta the two cords were tied together in a real knot, and the one was afterwards twisted round the other several times."

The condition of the cord at the place of the knot, has been brought forward by some writers to prove the date of their formation, whether at delivery or earlier in the pregnancy.

Dr. Priestly[1] says that, "early in pregnancy, when the fœtus is small, and the liquor amnii is proportionately large, knots may be formed on the cord. Later in pregnancy also, or at delivery, they may also be formed, if the cord is very long. The difference between those formed early, and at birth, is, that the former cannot be untied and straightened out, while the latter can." (See also Dr. Lee's cases, quoted *ante.*)

The data thus presented are sufficient to show that it is the common belief of the profession that knots on the cord may be formed during the intra-uterine life of the child, as well as at the time of delivery. The evidence upon which this opinion is based may be divided into two kinds: 1st, that derived from the state or condition of the fœtus, and the cord at the place of the knot: 2d, the complexity of the knot itself, and the supposed difficulty of its being tied at the time of delivery, when the child passes through the organs of the mother.

And 1st: As to the evidence derived from the condition of the fœtus at birth:—

In regard to this part of the evidence, many writers, without questioning its validity, have assumed that in all those cases where the child has been stillborn, with a knot on the cord, its death was the result of such obstruction.

But, in reality, this is no proof at all, for the same condition of the fœtus—*i. e.*, stillborn—is observed very much more frequently when there are no knots on the cord. The final decision, therefore, whether the death was a coincidence only, or the actual result of the knot, must be determined on other grounds.

For still stronger reasons, if the condition of the fœtus at birth, whether alive or dead, when a knot is found on the cord, cannot be brought in evidence that the death resulted from the constriction of the cord by the latter, it cannot be offered in proof as to the *time when the knot was tied;* for in the first place, children are born alive with knots tightly drawn on the cord, and in the second place, children are born putrid, with the skin peeling off, and in all respects like what Smellie (see *ante*) reports, in many instances where there is no obstruction to the circulation of the blood through the cord, in consequence of a knot having formed on it. Now, when similar results occur under different conditions, or different results under similar conditions, it is a fair inference that they cannot stand to each other in the relation of effect and cause. That is to say, if children are found both alive and dead, under exactly the same circumstances, so far as the knot is concerned, the question as to the effect of the previous formation of the knot in causing the death must be settled upon the probabilities of the case, upon the validity of the proof whether a knot can be thus tied in utero, and vice versâ; unless it can be reasonably inferred that the death resulted from the knot on the cord, no proof can be deduced from its occurrence, that it was tied while the child was alive.

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[1] Med. Times and Gaz., Feb. 26, 1859; also, Lect. on the Gravid Uterus, p. 75, Lond. 1860.

And here, perhaps, is the turning point of the whole matter; for, if by any reasonable proof it shall be decided that knots can be tied in utero, the death, when they are found, may fairly be attributed to them with just as much reason, as in their absence to any other cause.

We come next to the evidence derived from the condition of the cord at the knot, whether compressed or otherwise, or so firmly fixed in the shape of the knot that it cannot be made to return to its former state before the knot was tied.

In regard to this point Dr. Priestly (see *ante*) asserts that "the difference between those (*i. e.*, knots) formed early and at birth is, that the former cannot be untied and straightened out, while the latter can."

If we take a fresh cord, before it becomes cold and has lost what little vitality it possessed, and tie a knot in it as tight as may be, and leave it in this condition till it becomes thoroughly dead, till it is in the same state that the body is in when it has become stiff with cadaveric rigidity, and which, in so small a body as the funis, is reached in a very short space of time, not exceeding a few minutes, we shall find when we untie the knot, that it no longer returns to its former round, pulpy, and ordinary form; it is thin, ribbon like, and condensed, and has a strong tendency to retain the curved and curled shape which it held when in the knot. In other words, it is in precisely the same state, which Dr. Priestly considers to be a proof that the knot had been tied for an indefinitely long time. The same result is obtained by tying a ligature round the cord, or subjecting it to any force which will compress it while still alive, and which is not removed till the fluids within its substance have become cold and coagulated by the loss of its vitality. The condition of the cord at the knot cannot, therefore, be quoted in evidence as to the time when the knots were tied.

And, moreover, it needs but a moment's reflection or consideration to satisfy any one that if sufficient tension should be made on the cord in utero to draw the knot tight and compress the vessels so as to produce the condition mentioned by Dr. Priestly, it would of necessity stop the fœtal circulation, and the child would die. But, as before remarked, the children are not always dead, and therefore the knots could not have been drawn tight before birth. The only exception to this tightening of the knot which could occur, would be in those cases where the cord is so long as not to be put on the strain, after the body of the child had passed through the bight which forms the knot. But the shortness of the cord in many of the instances reported, negatives this supposition; and in those cases where the cord is so long as to be coiled round the neck once, twice, or even oftener, such as the cases reported by Dr. Zollickoffer, Dr. Lee, and Baudelocque (see *ante*), the fact that at the first turn of the child's body the knot would be drawn tight, and in consequence the child become at once asphyxiated and die, render the conclusions drawn from such premises unworthy of credence; since in those very cases the coiling of the funis went on after the first strain on the cord, to the extent of a second entire coil about the neck in the one case, and about the neck or chest in the other, and yet both children were born alive.

Dr. Lee (see *ante*) remarks that the knot in one of the cases he reports, must have been tied a long time before delivery, for the cord was atrophied between the knot and the umbilicus. But if the knot was drawn so tightly as to obstruct the circulation, the child could not have lived long enough in utero, after the knot was tied, to have given time for any such state of the cord to have become evident, or any such condition of the child to have developed itself as would have resulted from a lack of nourishment for a period of time.

Following out the division of the argument, we come next to consider the nature of the proofs derived from the complexity of the knots, as bearing upon the question of the possibility of their being tied at any other time and in any other way than by the child while in utero.

The intricate nature of some of the knots which have been recorded and figured (*e. g.*, that of Baudelocque, quoted by Montgomery and Lee (*ante*), a copy of which has been already given in this article, and the figure of 8 knots, so called, also mentioned by Montgomery (see *ante*) and reported by Dr. Wm. E. Coale of this city), seem to have inspired the greatest reverence in writers, who have held them up as being among the incomprehensible things of midwifery, the result of an inscrutable cause.

But before we proceed further in discussing this part of our subject, it will be well to consider another question as a preliminary step to its more perfect solution. That is to say, What are the probabilities, taking into consideration the condition of the fœtus in utero, that it can pass through a loop of the cord and form the knot during its intra-uterine life?

What are the facts? To tie the knot, two conditions are essential: 1st, that there be a loop; 2d, that the child should pass through it. But so long as the fœtus remains suspended by the cord, or until the time when the cord has acquired a length sufficient to allow the child to rest on the walls of the uterus, a loop can by no possibility be formed; and after this time, in order to form the knot, the fœtus must pass entirely through the bight of the loop, and clear it on the other side. Now, although the fœtus in utero may revolve on its axis, and extend itself by kicking and straightening out its limbs, is it supposable, is it within the bounds of probability, that there is room enough in the uterus for the acrobatic display necessary to tie a knot, or form it even, on the cord?

In the case quoted by Prof. Storer, which is the only one on record in which any such connection between cause and effect, as at first glance seems to be there apparent, has been proposed, a second thought will show that the conclusion is scarcely warranted by the premises. If we take into consideration the conditions—patient seven or eight months pregnant, the child of course proportionately filling the cavity of the uterus—it seems almost beyond the bounds of possibility that a loop on the cord of sufficient size (five inches at least in diameter, fifteen inches in circumference) to allow the child to go clear through, could have been formed there; or that room enough for the fœtus to go through it, and turn and draw the knot tight, could have been afforded within the abdomen of an ordinary sized woman.

And again, if all this could take place, there are other reasons which add to its difficulty. If loops should form on the cord, they would, from the weight of the cord itself, naturally fall to the lowest part of the uterus, wherever, for the time being, that might be, and we can hardly conceive of any other arrangement. They might slip about, and slide from side to side, but the structure of the cord does not possess sufficient firmness to keep it upright in the form of an open loop, even were there room for it in the uterus.

If it be objected to this view of the question, that in the earlier periods of pregnancy, before the fœtus acquires bulk enough to largely encroach on the intra-uterine space, all the movements necessary for the formation of a knot can be easily made, it may be answered that before the tenth or twelfth week, by which time the fœtus has gained nearly one-third of its final size, and has by this very growth rendered any free movements in utero, except that of rotation, difficult, there is no twist in the funis; and until this takes place, it will not form loops from which knots can be tied, but only flexures. This view is corroborated by all the specimens of knotted cords that have been inspected, which show that the twist in every one of them is strong and decided, and has apparently thrown the cord into the kinks which form the foundation structure of the knots.

But it may be said that cases are reported on unquestionable authority, in which at the birth of the child the cord has been found tied in the groove of a limb almost separated or amputated in utero, and which must have been the effect of the stricture from the knot long before tied. Montgomery, in his essay upon "the Spontaneous Amputation of Fœtal Limbs in Utero," appended to his great work on the Signs and Symptoms of Pregnancy, discusses this subject at length, and has collected together a great number of cases bearing on this point. Though hardly firm in his convictions, he inclines to the belief that the pressure of the cord acting in this way, is one of the causes of the amputation. In Case No. 37, quoted from Siebold's Journal (Bd. xvii. st. 2, 1838), Montgomery reports that

Dr. Schwabe found "the umbilical cord wound round the right leg a little above the ankle, where it *formed a knot*, by which the development of the parts was completely prevented, and the foot nearly separated from the leg."

It is not worth while to question the fact here noted—that when the child was born the cord was found knotted in the groove of the limb—even if the authority was not unquestionable; but by what kind of proof can we connect the two together as cause and effect? Can we suppose that a degree of constriction sufficient to have caused the amputation, could have been exerted on the limb by the cord, and in the form of a knot also, with one part crossed over the other, adding compression to extension, without interfering so much with the circulation in the cord as to kill the child? As regards the ability to keep up the circulation under direct tension of the vessels, the difference between a simple coil and a knot is very great indeed, and it is much more probable that the knot was caught and retained where it was found at birth, after it had been tied by the child during its egress from the uterus passing through a loop, than that it had been previously formed on the limb in utero, and by its constantly exerted pressure caused absorption of the integuments beneath it. And in this connection it is worthy of notice, that in the great majority of the cases reported, the lesion attributed to the pressure of the cord is not the only one found. Various deformities, often uniting in the same case, show that the tendency is to abnormal growth or arrest of development, either of which would produce the results attributed to the pressure of the cord.

But if the pressure of the cord exerted on a limb produces such evident effect, why should it not always bring about the same result? Why should not the same amount of pressure, in every case, produce absorption of the integuments at the place where the pressure is made? Why is it that no instance of amputation of the head, or signs of decapitation, have ever been noticed in cases—and they are by no means rare—where the cord is once, twice, or even oftener round the neck? Or, at least, if the neck, for wise and good reasons, should escape, why does not the cord leave some depression, or mark of its contact, along the course it took across the clavicle, up one side of the neck and down the other? Certainly the integuments of the fœtus are alike throughout, and why a result will follow certain causes in the one case, and not in the other, it is impossible to understand.

It appears strange that no attempt should have been made, by actual experiment, to imitate these knots. But such, so far as any record exists, is really the fact. No one has thought that, by very simple and easy manipulations, the most complex and reduplicated knots could be imitated at pleasure, and in the very way also in which they are probably tied—by the child at delivery, and at no other time, slipping through a bight (to use a nautical phrase) of the cord lying round the os uteri.

Prof. Miller (see *ante*) very summarily explains the whole matter, by supposing that the child, after the cord has coiled round its body, slips through, and thus ties the simpler kinds—for the complex knots he has the same reverence that inspires all the rest. But this is not so. It is impossible to tie a knot, so long as the cord remains simply *coiled* about the body or neck of the child. Suppose this to be the case—the child slips through, and the cord comes straight without any complication, in every attempt. But let a loop be formed in the cord, *i. e.*, let one part of the funis be crossed on the other, and the same passage of the child through it ties the knot, invariably and at once, differing in complexity just in proportion as we increase the number of turns on itself in the loop.

To make my meaning more clear, take a string, one end of which is fixed to some object, representing the placenta, and the other free, but which shall represent the umbilical end of the cord. If now we take up a loop of this string, and turn it once on itself, so as to bring its two parts across each other, and pass the umbilical end of the string through the bight thus formed, we form and tie the single knot, as represented in Fig. 7.

If we twist the loop once more, that is, twice on itself, and proceed as before, we get the double, square, or figure-of-8 knot, so called, which we have here. (See Fig. 8.)

Fig. 7.

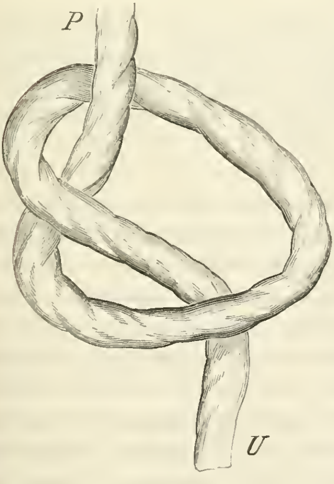


Fig. 8.

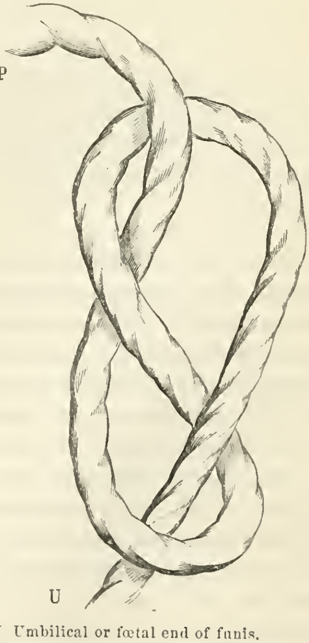


Fig. 7. Single Knot.—*P.* Placental end of funis. *U* Umbilical or fœtal end of funis.

Fig. 8. Double or Figure-of-8 Knot.—*P.* Placental end of funis *U* Umbilical or fœtal end of funis.

If we take two loops, each with a single turn and as near to each other as may be, and pass the free end of the string through them, we have formed the combination which, when drawn tight, exactly imitates Dr. Lyman's knot. (See *ante*, for illustration of this.) If one of the loops has a double turn on itself and the other but one, we get the knot figured by Baudelocque, and already drawn and explained. In this way one, two, three knots, or more, provided the length of the cord suffices, may be tied upon the same cord, and at various distances from each other, if instead of tying them together in one complex knot, each one as fast as it is tied is allowed to come through the other loops and tie in reversed order, the lowest loop on the cord forming the last and uppermost knot when they are finished.

If the argument thus set forth is sound, and a case does not occur in which while yet in utero a knot is found tied upon the umbilical cord, and of which, so far as any records at hand have been consulted, no instance has been found, the opinion held by many members of the profession as to the mode in which they are produced is erroneous, and the only way they can be tied, and the time when they can be formed, must be by the passage of the child through a loop of the umbilical cord lying around the os uteri when it is ushered into the world.

ART. V.—*On Veratrum Viride as an Arterial Sedative.* A mutual paper made up of contributions from members of the Massachusetts Medical Society. By E. CUTTER, M. D., TRUMAN RICKARD, M. D., and WM. INGALLS, M. D., Committee of the Middlesex East District Medical Society.

IN the October (1858) number of the *American Journal of the Medical Sciences*, the "Veratrum Viride Committee" of the Middlesex (Mass.) East District Medical Society published a paper, entitled "*Veratrum Viride as an Arterial Sedative;* a mutual paper made up of contributions from the members of the Middlesex East District Medical Society, Massachusetts." It contained a brief history of the use of the remedy in years gone by; its botanical characters; its physical properties; its chemical composition; the time for collecting the root; the mode of preparing the tincture; its therapeutical effects; and the literature of the medicine. Following this was the general and special testimony of the members in respect to its action as an arterial sedative, the latter being presented by reports of cases.

Having presented about four hundred two-ounce phials of the tincture of veratrum viride to the Fellows of the Massachusetts Medical Society, at the annual meeting in May, 1857, we addressed a circular to the recipients as follows:—

> Sir: Please to communicate, at as early a day as possible, any facts you may have derived from the use of the veratrum viride. We hope not to seem importunate, but we beg to remind you that we are endeavouring to prepare a report upon this article which shall, in some degree at least, be commensurate with the implied hopes contained in the circular accompanying the bottle of tincture we presented to you last May. We are desirous of obtaining any general and special evidence relative to the value of this agent as an arterial sedative from reports of cases in which it was used—including the dose, the frequency of its exhibition, and the effects upon the pulse from day to day, whether favourable, unfavourable, or inappreciable; together with any collateral testimony as to its value otherwise than as an arterial sedative.
>
> Please address either of the undersigned.
>
> Respectfully yours,
> EPHRAIM CUTTER, M. D., Woburn,
> TRUMAN RICKARD, M. D., Woburn,
> WILLIAM INGALLS, M. D., Winchester,
> *Committee of the M. E. D. M. Society.*
>
> Woburn, April, 1859.

In response to this circular we have received thirty letters from gentlemen not members of our District Society. Some of these letters state frankly that the writers were very sceptical in respect to the ascribed virtues of the veratrum viride, and had made no fair trial of it; others show that, although they have used it, they were afraid to trust in it, and consequently so combined it with other remedies, that the particular effect of either could not be stated; others have given it a fair trial, and express themselves very highly pleased with the results. And such, we are confident, will always be the case, when an intelligent discriminating use is made of the article. We know very well that there are cases where it fails of producing the ordinary good results to be expected from it; but this militates nothing against its value. The same is true of all our most prized remedies. Why, then, should any one throw the veratrum aside as worthless, because it did not do all he anticipated in the first or second trial? The fault may have been in some idiosyncrasy of the patient, or in an inadequate dose for that particular case. Were there no exceptions, did the medicine *never* fail, it would indeed be a specific. But the experience of the whole medical world tells us that no specific has as yet been discovered, and it is foolishness for any one to expect that there ever will be. A use of the article will show that it is as certain of producing its peculiar effects, as calomel, or any other agent of the materia medica.

The statements contained in the letters we have received are mostly general. We regret that more *cases* were not reported in full, as these show clearly and definitely the effects produced by the medicine. But the fact that intelligent, observing men have been exceedingly pleased with the effects of the veratrum viride, should inspire as much confidence in the minds of the sceptical, as cases recorded in detail. If they will not believe the one, neither would they be convinced by the other.

From the letters we derive the following testimony as witnessing to the value of the veratrum viride as an arterial sedative, and this paper concludes the labours of the committee. We give the language of the writers as nearly as possible, although at the risk of repetition, as we desire to place before the medical public *all* the evidence we have collected.

Through one of the committee we are enabled to present the accompanying illustrations: The plant, Fig. 1; the root, Fig. 2; the flower, Fig. 3; the seed envelop, Fig. 4; and the early appearance of the plant, Fig. 5; drawn from nature, by Mr. S. W. Abbott, student of medicine. It is hoped that they will aid the country physician in the labour of collecting the same for his own use.

In the present paper we have not arranged the evidence as before, into general and special, but have concluded to summon each witness singly, and suffer him to tell his story to suit himself.

Dr. S. S. GIFFORD, M. M. S. (Member of the Massachusetts Medical Society), says: "I cannot practise without that medicine. I sent to Boston, bought two ounces, paid seventy-five cents. It is good for nothing compared with yours."

Dr. W. W. COMSTOCK, M. M. S., of Middleboro, says: "I have been using the veratrum viride, and have found it in all cases of increased frequency of the pulse, and tonicity, all that its friends have claimed. In atonic diseases, as erysipelas and scarlet fever, I have seen no benefit resulting from its use; but, on the contrary, I am quite sure I have seen it do harm. Its most decided beneficial effects I have witnessed in pneumonia; and, indeed, I should now hardly feel prepared to treat a severe case without it."

Dr. A. RUPPANER, M. M. S., of Boston, reports good effects of the veratrum viride in erysipelas, phthisis, pertussis, and scarlatina.

"CASE I. L. W., a German, with erysipelas of the face. Had been treated by an irregular practitioner. When I first saw him he was delirious, had high fever, pulse 123, very full. Gave gtt. No. v. of your preparation of the veratrum viride, in water, and ordered the same to be given every three hours. Fourteen hours after the first dose, the pulse was reduced to 88. It was constantly kept at that standard, and even lower. Whenever I omitted the medicine, the pulse rose, and fell again as I resumed the same. Patient recovered.

"CASE II. A merchant, aged twenty-two years, with advanced phthisis. Had had repeated attacks of hæmoptysis. Pulse 118—120 per minute. With five drops of the tincture of veratrum viride, thrice daily, the pulse was reduced to 85 per minute, and kept there steadily day after day. Continues the veratrum daily.

"CASE III. A little girl, aged one and a half year, had hooping-cough, followed by pneumonitis. One drop of the tincture of the veratrum viride, given every four hours, succeeded admirably.

"CASE IV. An infant, of eleven months, had scarlatina. During the febrile stage, one drop of the tincture of the veratrum viride, with syrup of squills, four times daily, reduced the pulse readily."

Fig. 1.

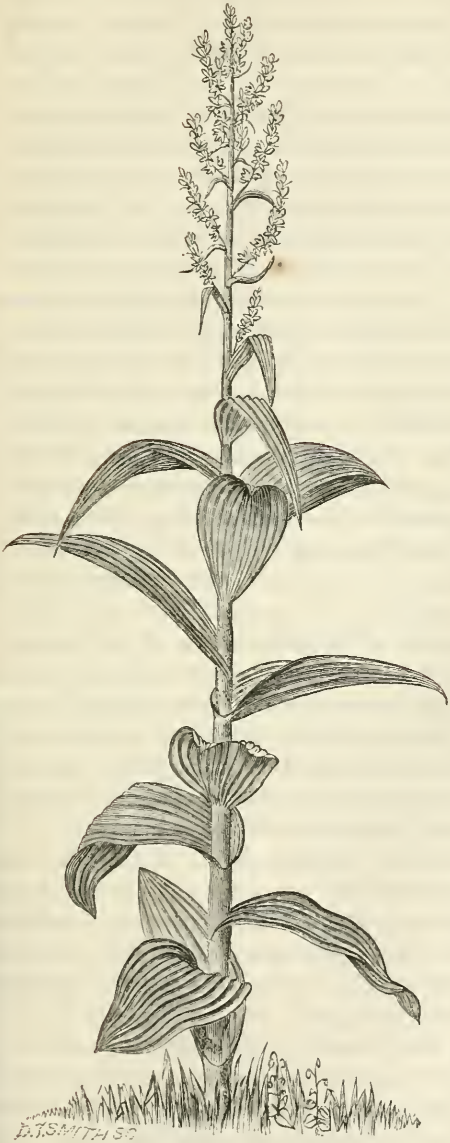


Fig. 3.

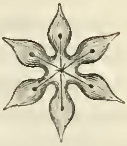


Fig. 4.

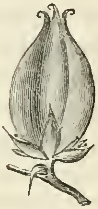


Fig. 5.

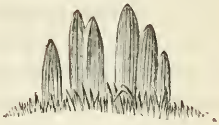
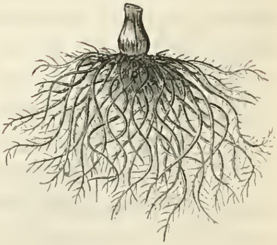


Fig. 2.



VERATRIA VIRIDE.

Fig. 1, the plant; Fig. 2, the root; Fig. 3, the flower; Fig. 4, the seed envelop; Fig. 5, the early appearance of the plant.

Dr. WILLIAM WORKMAN, M. M. S., of Worcester, has used the veratrum viride for several years. He says: "My observation of the therapeutical effects of the veratrum viride, so far as it is of any value, coincides with the report of your District Medical Society in regard to it. I believe the veratrum viride, when its virtues are fully known, will prove a most valuable accession to our materia medica.

"I think I have seen most decidedly good effects from its use in cases of pneumonia and broncho-pneumonia, where these local inflammations succeeded simple or typhoid fever, and the pulse continued to be accelerated long after the fever had subsided, with harassing cough. It has seemed to me more efficacious than any other remedy I have used, in reducing the frequency of the pulse, and allaying the cough and irritability of the vascular and respiratory systems. I have seen several recoveries under the use of the veratrum viride, combined to be sure, but in cases in which I had great apprehensions would terminate in phthisis. I gave it to a patient with anæmia, for some time, but in ordinary doses its action on the heart was very slight. An indefinite quantity, however, taken carelessly, reduced the pulse for a time from 112 beats per minute to 60. It produced other distressing symptoms, vomiting, burning and oppression in the stomach, faintness and great prostration of strength. The pulse, however, the next day returned to its former frequency, and no perceptible benefit was derived from its use in this case. In some cases of tuberculosis I have given it with apparent benefit."

Dr. Workman gives an example of the collateral use of the veratrum viride. He says: "I first used it several years ago as an external application in a number of cases of obstinate prurigo, which had resisted various other remedies. It was used in the form of an ointment—the pulverized root being combined with sulphur and lard, and applied freely. It produced considerable irritation of the skin—severe burning and smarting, &c.—but was completely successful in removing the disease."

Dr. H. C. BICKFORD, M. M. S., of Billerica, says: "I have used the tincture of the veratrum viride for the last two years. The results, in my hands, have been more marked and satisfactory in pulmonary complaints than in any other. In bronchitis and pneumonia of children, I rely upon it almost entirely. I have realized all the good effects from the medicine which its most sanguine friends claim for it."

Dr. JAMES W. ROBBINS, M. M. S., formerly of Uxbridge, Massachusetts, now of Houghton, Michigan, writes that he made a trial of the veratrum viride and distributed several phials of the tincture to physicians for trial some fifteen years ago. He took it himself and reduced his pulse to 38 beats per minute, keeping at the same time about his ordinary business and experiencing no inconvenience except a little dazzling of the eyes. He says: "It has qualities which will always retain it in use—qualities which no other article possesses, and those of a valuable character. I have watched its effects more particularly in pneumonia than in any other disease, and here I find it to approach, if not equal, antimony in controlling febrile action without irritating, like that, the alimentary canal. It may be used to great advantage in acute rheumatism, not merely in that case, controlling febrile action, but exerting in a high degree the peculiar influence that other acrid narcotics possess over that kind of inflammation.

Dr. CHARLES H. ALLEN, M. M. S., of Cambridgeport, has used it in nearly all inflammatory diseases, and has observed no ill effects from its use even in infancy. He says: "In all cases I order small doses much diluted, every hour until the arterial action has very much lessened, and for three reasons: 1st, it is more willingly taken, especially by children; 2d, less danger of overdosing exists; and 3d, very much diluted it is more readily absorbed and more quickly effectual."

Dr. E. A. HOLMAN, M. M. S., of Harvard: "My apology for not having reported earlier, the results of my limited observation of the action of this most potent remedial agent is, that the scepticism with which I am largely favored, with regard to medicine, as well as many of the other novelties offered in these fast times, required the confirmation of many trials of the medicine to establish my first impressions, and to enable me to judge accurately of its merits. And now, I unhesitatingly and emphatically declare the veratrum viride to be the most reliable arterial sedative I have used. The diseases in which I have most frequently administered it are typhoid fever, pneumonia, scarlatina and rheumatism, and *not in a single instance have I failed to control the pulse to my entire satisfaction*, thus enabling me to save some patients whom *a thirty years' experience assures me I should otherwise have lost.* I have administered the tinct. veratri viridis in doses varying from one to eight drops at intervals of two to eight hours. In highly inflammatory cases I commence with a large dose, six to eight drops, repeating it every two hours till vomiting ensues, which is generally from the second or third and frequently the first dose, and the pulse falls from 100 or 120 to 50 or 60 beats per minute, and is kept at any desirable point, by two to four drops at intervals of two to four hours. Vomiting, or even nausea, I think unnecessary to insure the sedative effect, and should generally be avoided—in asthenic cases always—though that point should be approximated as nearly as convenient. I have found three or four drops at intervals of three or four hours, ordinarily, as much as the stomach will tolerate. I have not found the veratrum viride cumulative—yet it seems not to lose its power by continued use. The only bad effects I have witnessed, were, the ordinary results of nausea and vomiting, which soon subside on the temporary discontinuance of the medicine, or on the administration of a slight opiate."

Dr. ALEXANDER POOLE, M. M. S., of Chelsea, writes that he has had but little experience with it, but so far as his observation extends, it has acted speedily, and with more certainty than any other article with which he is acquainted. In one case of pneumonia he gave six drops once in five hours, and by the third dose the pulse had fallen from 120 to 56, at which point he was able to keep it by continuing the dose at longer intervals. He says: "I consider it a very valuable medicine."

Dr. HENRY C. PERKINS, M. M. S., of Newburyport, used the veratrum viride in a case of acute pleurisy after other active treatment had reduced the most acute symptoms, and the pulse fell within three or four days under doses of four or five drops repeated every four or five hours, from 120 to 80 beats per minute. In an aged lady, suffering under acute pneumonia, five drops of the tincture of veratrum viride every three hours seemed to produce diarrhœa. Dr. Perkins also states, that his friend Dr. Howe, had a case of pneumonia in a child of ten years, where the sedative effect of the tinct. veratrum viride was most marked. "A similar remark I might make (second hand) from Dr. Merrill, of Hampton, N. H. I have no doubt myself of its similarity to digitalis, and from what I have seen and heard of it, should believe it a much safer medicine to be used in dyspnœa, inflammatory affections, etc."

Dr. OTIS E. HUNT, M. M. S., of Weston, regards it as a valuable medicine. His manner of using it has been to give five drops of the tincture every thirty minutes till the pulse fell. He says a few drops would sometimes accomplish the object, and at other times a half dozen would be required. He has found it very apt to produce nausea.

Dr. JOHNSON GARDNER, M. M. S., of Pawtucket, says he has frequently administered the veratrum viride to his patients, where an arterial sedative was indicated, and has found it a far more potent and certain agent than he had previously supposed.

Dr. C. W. WHITCOMB, M. M. S., of Barre, speaks favourably of the veratrum viride as an arterial sedative, though not *always* reliable, but as much and more so than any other remedy with which he is acquainted.

Dr. FRANCIS MINOT, M. M. S., of Boston, reports the following case:—

A young man, nineteen years of age, entered the Massachusetts General Hospital under my care, Oct. 9th, 1858, with acute pericarditis. His pulse was quite irregular in frequency, varying between 96 and 116. On the 12th, at the morning visit, it was at 112 to 116 per minute. The inspirations were 30 per minute. He was ordered four drops of Thayer's fluid extract of veratrum viride (which is the preparation commonly used at the Hospital) once in two hours. He became more comfortable during the day. The pulse in the evening was at 96. He had a more quiet night.

Oct. 13th. Pulse 88; respiration 36. Reports that he is better. He took seven doses of the veratrum, and it was stopped this morning on account of the patient's vomiting.

14th. Comfortable night. Pulse 112; respiration 36. Resume veratrum.

15th. Took six doses of the veratrum without vomiting and without much effect on the pulse, which is now 112; respiration 30. Increase veratrum viride to gtt. No. v.

16th. Took three doses of veratrum yesterday. Pulse in evening 110; now 104; respiration 40. Take veratrum only when feverish.

17*th*. Pulse 112; respiration 24. (Pleurisy of left side.) Veratrum gtt. v, every four hours.

18*th*. Yesterday he was tranquil. Pulse in evening 108; now 96; respiration 22. Took five doses of veratrum, and vomited after the last.

19*th*. Patient appears better. Pulse 96; respiration 24. Took four doses of veratrum, nauseated by the last.

20*th*. Pulse 100; respiration 30. Took three doses of veratrum, and was nauseated by it.

21*st*. Pulse 96; respiration 28. Signs of effusion into left chest. Took four doses.

22*d*. Pulse 96. After examination of chest 120. Congestion of right lung. Took five doses of the veratrum.

23*d*. Pulse 100.

24*th*. Pulse 104. Veratrum gtt. iij, every three hours.

25*th*. Pulse 100.

27*th*. Pulse on waking from sleep 120. Omit veratrum.

The cardiac symptoms returned at this time. Soon after he came under the care of Dr. Bowditch. He had œdema of the legs and other grave symptoms.

Nov. 20*th*. Had an attack of pain and palpitation after dinner yesterday. Took tinct. veratri viridis gtt. ij, with a drachm of solution of morphia with much relief. Asks to have the veratrum continued. Resume it gtt. vj, thrice daily.

21*st*. Better. Vomited twice after taking veratrum. Pulse 100.

23*d*. Better. Only two half doses of the veratrum borne. Pulse 100.

26*th*. Improving. Pulse 112. Omit veratrum. This patient finally recovered. The remedy appeared to have considerable effect in diminishing the febrile condition of the patient, but did not prevent the complications of pleurisy and pulmonary congestion.

Dr. M. R. Randall, M. M. S., of Rehoboth, says that he is compelled to add his testimony in favour of the veratrum viride, as one of the most valuable medicines as an arterial *regulator* that has ever come under his notice. In concluding his letter, he says, "I would not be deprived of it on any consideration whatever."

Dr. A. A. Kendall, M. M. S., of Newton Lower Falls, says: "I have used the veratrum viride constantly in my practice for more than two years, and with ever-increasing satisfaction. I have found it very reliable as an arterial sedative in acute rheumatism, scarlatina, pneumonia, pleurisy—in short, in all cases attended with *sthenic* arterial excitement. I have given it to patients of all ages, and very rarely have I seen any unpleasant effects—in but one instance has there been distressing nausea and vomiting. Sometimes, though rarely, I have seen no appreciable effect upon the pulse."

Dr. C. A. Wilcox, M. M. S., of Uxbridge, says: "I have made frequent use of the veratrum viride during the last twenty months, having prescribed it in pneumonia, pleuritis, peritonitis, and acute rheumatism, also in hæmoptysis from consumption, when attended with a frequent pulse. From this repeated use I have come to look upon it as a valuable remedy, *almost certain* in its effect as an arterial sedative, and through this it becomes an antiphlogistic which I think does not depress the vital forces like bleeding, antimony, and active purgatives. In the case of a female, 22 years of age, from a strongly marked consumptive family—reduced by lactation, seized with double pneumonia, her general condition forbidding bloodletting—the state of the bowels not admitting of cathartics—stomach refusing nauseants—and the patient growing worse daily. I commenced with the veratrum viride on the fourth day of treatment, with the pulse at 135 beats per minute. The next day it stood at 120, the next after that at 100, and on the third day at 85. All the other symptoms improved in proportion with the pulse. I have thought it acted as an expectorant, but have considered this, as well as most other properties ascribed to it, as depending upon a reduced inflammatory action which most surely follows its sedative effect."

Dr. JOSEPH G. S. HITCHCOCK, M. M. S., of Foxborough, has used the veratrum viride several years. Thinks it must satisfy all *reasonable* expectations. Thinks the tincture made from Southern roots better, probably, than that from plants growing at the North. Thinks our tincture not equal to that he had been using, and not as certain in its effects. Ranks the veratrum viride along-side of antimony.

Dr. JAMES M. NYE, M. M. S., of Lynn, has used the veratrum viride in many cases, and with great benefit, particularly in puerperal fever, peritonitis, pneumonia, pleuritis, and also in other diseases when attended with great excitement of the heart and arteries. In his practice, he says it has not failed to control the pulse when given in the ordinary doses. Thinks it especially useful in pneumonia and pleurisy.

Dr. A. D. BACON, M. M. S., of Sharon, says he has never found any other drug so sure and so efficient as an arterial sedative. He has used it for two or three years, and it has seldom failed of producing the desired effect upon the pulse. Has found it especially useful in cases where there has been a tendency to congestion of the lungs. In such cases he says he should rather be without any other article of the materia medica than this; can call to mind cases where he thinks he should have lost his patients but for the veratrum viride. "I have just discharged two patients, one an old and the other a young man, in whom it seemed to act like a charm, speedily reducing the pulse from 100 or more, to 70 in one case, and to 60 in the other, thus relieving the dyspnœa, removing the congestion and at once diminishing or suppressing the bloody expectoration, and thus permitting the vital current to flow on without obstruction in its wonted channels."

Dr. F. F. FORSAITH, M. M. S., of South Abington, had used the veratrum viride some months previous to receiving our tincture. In many instances he has been exceedingly pleased; in some disappointed. "In many of these latter cases, had I been so situated as to be able to administer the medicine myself or to watch it closely, so as to obtain its full effects, I have no doubt it would have been otherwise. In using an agent of so much power for good or for evil, I think too much caution cannot be enforced. Still, I have used it almost constantly for nearly two years, and have been so much gratified with its effects when pushed to its proper extent, that, in all cases suited to its exhibition, I rely upon it; finding it to act with more efficiency as an arterial sedative, and with less disturbance of the system generally than any agent with which I am acquainted. I send you the report of two cases, one of which is of an ordinary type, and the other the only instance in which I have observed any really serious difficulty from its use.

CASE I. *April* 25, 1859. W. S., aged two years, had been under domestic treatment for three days. Pulse 150; tongue heavily coated; skin hot and dry; no appetite; a dry cough; rough respiration over most of right lung: some delirium. Tincture of veratrum viride two drops once in three hours.

26th. Pulse 128; tongue still coated heavily; cough rather looser; skin losing its dry, harsh appearance. Continue treatment.

27th. Pulse 92; tongue cleaning; cough loose and frequent; skin moist. Continue veratrum and give ol. ricini f℥iss.

28th. Pulse 92; tongue cleaning finely; some appetite.

30th. Pulse 88; appetite fair; sleep quiet; cough loose; tongue nearly clean: patient sitting up.

CASE II. *Jan.* 19, 1859. F. E., 2½ years of age. A delicate child. Has been ill for two or three days. Restless and irritable. No appetite. Tonsils much inflamed, particularly the right. Inflammation extending somewhat upon the lungs. Pulse 120; tongue thickly coated. Tincture of veratrum viride, gtt. ij, to be given once in three hours.

20th. 9 A. M. Pulse the same; increased dyspnœa; skin hot and dry. Tr. veratri viridis gtt. iij, to be given once in three hours. The pulse became reduced gradually, the skin more moist, and the symptoms generally more favourable. At 9 P. M. I was hastily summoned, as they "feared the child was dying, as there was spasmodic action of the limbs, and the eyes were set in her head." Found the statement not exaggerated. Pulse 40, wavering and uncertain; respiration 15, laboured and sighing. Ascertained that the mother had administered the medicine a little before the stated time, and the father, not knowing it, had given an extra dose a few minutes after. With alcoholic stimulants and external irritations the circulation by degrees grew natural, and before morning was much the same as on the day previous. The veratrum viride was resumed in smaller doses and with more caution, and all went on well till entire recovery in about one week.

Dr. E. W. A. HARLOW, M. M. S., 52 Essex Street, Boston, sends us an unfavourable report of the effects of the veratrum viride as an arterial sedative. We are much obliged to him, as we wish to give a truthful representation of the whole subject, and not to claim more than its merits deserve. He says:—

"I have used the tincture of the veratrum viride, which I received a year ago, in two cases. The first was that of a girl, 15 years of age, with rheumatic carditis. Her pulse was 120 or more day after day. I directed eight drops of the tincture of veratrum viride three or four times a day. The medicine was taken for about four days in succession, but without any appreciable effect upon the circulation. Certainly the pulse was not diminished in frequency."

Perhaps Dr. Harlow might have succeeded better by giving the same dose every two hours till nausea or vomiting supervened, and then continued the medicine in smaller doses.

"The second case was that of a young man, 23 years of age, affected with hæmoptysis. Soon after each attack of hemorrhage the pulse became rapid, from 120 to 140 beats per minute, full and hard. He had what is sometimes called a 'hemorrhagic pulse.' He took the tincture of the veratrum viride every three hours, commencing with three drops, and increasing each dose one drop. I could not perceive that any effect was produced upon the pulse until vomiting occurred. Soon after vomiting the pulse would begin to resume its great rapidity, when the veratrum viride was again administered, commencing with three drops and increasing each dose as before."

Dr. GEORGE D. COLONY, M. M. S., of Athol Depot, reports that he had used Tilden's fluid extract of veratrum viride previous to the reception of our tincture, and finds them apparently of the same strength. In all of those cases in which the medicine was fairly tested, its remarkable sedative properties manifested themselves in a very great reduction of the force and frequency of the pulse, perspiration, and as great an alleviation of all the other symptoms as usually follows venesection. Dr. Colony gives the interesting report of two cases that occurred under his observation. He says:—

"CASE I. About a year since I was in attendance upon a gentleman, F. T., about 40 years of age, sick with pneumonia. The patient was predisposed to phthisis, and had for some time been in poor health. With other marked symptoms of this disease the pulse was at 125. I at once resorted to the veratrum viride, without the aid of any other important remedy except cupping. I commenced with four drops of Tilden's preparation and increased to six, repeating the dose once in four hours. I was suddenly summoned in the night, not more than twenty-four hours after the beginning of this treatment, to see the patient, who, with his attendants, were much alarmed at the change which they had observed. I found my patient, as I anticipated, in reality much improved; for though there had been some retching and ineffectual attempts at vomiting, and the man thought himself dying, there was no ground whatever for alarm. The pulse had fallen to 75 or 80 beats in a minute, and the respiration was improved. The patient could not be induced to follow the treatment, and the pulse rose to nearly 100; but the severity of the attack was materially abated from that time, and the patient recovered his usual health.

"CASE II. A young Irishman, of good constitution, was sick with pneumonia. Pulse 120, with strong febrile excitement. I commenced as I had been in the habit of doing, with four drop doses; but, either from a want of faithfulness in the administration or other cause, no result followed after twenty-four hours. The dose was increased to six and seven drops, and strict regularity enjoined. But two or three doses had been taken before I was anxiously informed that 'Johnny was dying.' I was not alarmed, however, and found nearly the same result had taken place as in the case above related, and the patient speedily recovered."

Dr. ENOS HOYT, M. M. S., of Framingham, writes that he has used the veratrum viride in the apoplexy of aged people and those of enfeebled health, and finds it better than bloodletting, as the recovery is better. Has given as high doses as twenty to forty drops in four cases that came under his care, which resulted in recovery—which was heroic treatment. He thinks he has derived much benefit from its use in scarlatina, and he learned while at the South that the physicians there were using it with good results in the same disease. Where arterial excitement needs reducing it is decidedly better than digitalis. He says he likes it in measles, pertussis, and parotidea. He is testing it in a case of scirrhous breast, and thus far it has certainly arrested the increase of the tumour. He has also given it with good results in acute rheumatism. As collateral uses of the veratrum viride he has found it in the form of a bath or an ointment give great relief when applied to swelled and painful joints. In this connection one of the committee would state a similar experience in the external use of the veratrum viride. It has been employed in simple and gonorrhœal rheumatism, in mastitis, in puerperal peritonitis, and in erythema.

Dr. G. L. SIMMONS, M. M. S., of Sacramento City, Cal., has used the veratrum viride constantly for about two years, at the Sacramento County Hospital and in private practice, and has rarely been disappointed in its action. He has employed it in pneumonia, continued fever, acute rheumatism, and palpitation of the heart. He has employed it in scarlet fever combined with the chlorate of potash, and has frequently added it to cough mixtures for bronchial affections. He says he should be very unwilling to give up the use of the veratrum viride, as he regards it as one of the most potent and reliable articles of the materia medica.

Besides the above evidence derived from members of the Massachusetts Medical Society, the committee have received testimonials from other regular practitioners of medicine who have employed the tincture of veratrum viride, and who are not fellows of the above society.

Dr. A. B. CROSBY, of Hanover, N. H., thus writes:—

"It gives me great pleasure to testify to the admirable properties of the veratrum viride as prepared by you. I have found it much more reliable than Tilden's extract, and decidedly the most manageable arterial sedative I have ever used. I have witnessed no ill effects from its exhibition, but have found it an obedient and reliable servant. I have employed it during the prevalence of typhoid fever with marked good effect. In quite a number of instances where the symptoms of incipient typhoid fever were present its use has been followed by the immediate reduction of the pulse thirty or more in the minute, and the convalescence of the patient in from four to seven days. In affections of the lungs it has seemed to answer an admirable purpose, reducing the frequency of the heart's action so rapidly as to make bloodletting unnecessary. After surgical operations *involving the peritoneum* I have been well satisfied with its results. My father, Prof. Dixi Crosby, has employed it under similar circumstances, and I am permitted to say that he regards it as one of our most valuable agents in controlling the action of the heart. I cannot doubt that the veratrum viride will vindicate the high position which it now occupies, and will continue to be one of the most prominent and valuable articles in the materia medica."

Prof. E. R. PEASLEE, eminent as a teacher, a physician, and surgeon, remarked to one of the committee that he regarded the veratrum viride as being invaluable as an arterial sedative, and that he had derived the happiest results from its use.

Dr. C. S. BISHOP, of Philadelphia, Pa., has tested the tincture of the veratrum viride, prepared by ourselves, in many cases, a few of which he reports. He has particularly employed it in surgical practice with satisfactory results. In the irritation succeeding burns and operations it has proved a valuable sedative.

CASE I. *Medical student, injured by fire-works. Pulse kept at* 60. *The veratrum quelling the pain.* "One of the first patients to whom I gave it was a medical student, from Texas, who was injured by the explosion of a piece of fire-works—being burned about the face and neck. Saw him at about 10 o'clock P. M., two hours after the accident occurred. Applied glycerine and lime-water to the burned surface, and gave eight drops of the tincture of veratrum viride every two hours. At nine o'clock on the next morning his pulse, which at first was 100, had fallen to 51 beats per minute; and he told me that when he was lying perfectly still it had been as low as 48. He had taken forty drops of the medicine—having omitted two doses on account of the distressing nausea which it produced. He continued to take just enough of the veratrum viride to keep his pulse at about 60 beats per minute, for thirty-six hours, by the end of which time that portion of the burn which was merely reddened, had resumed its natural colour, and that which was vesicated was pale and healing rapidly. *From the time that the sedative influence of the veratrum viride became established he felt no pain.*"

CASE II. *Anchylosis of elbow.* "A boy, of about ten years of age, was brought to me with an injury of one of his elbows of some four weeks' standing. It proved on examination to be a fracture of the internal condyle, involving the trochlea, and was attended with the usual dislocation. Anchylosis had taken place to such a degree as to prevent motion, unless considerable force was applied. While he was under the influence of chloroform I broke up the adhesions, and reduced both the fracture and the dislocation. An anterior angular splint was applied, and the joint kept wet with cold water. Two drops of the tincture of veratrum viride were given every two hours, and the pulse was kept at between 60 and 70 beats per minute for about one week. There was little or no pain at the seat of injury, and very little heat or swelling. In about the usual time in such cases he recovered *perfectly* the use of the joint."

CASE III. *Contusions and cuts.* "A man, of about forty-five years of age, was very extensively cut and bruised by having been dragged some distance over the cobble-stones, beneath a wagon, which had upset upon him, with a runaway horse attached. Applied cold water to the injuries, and gave him six drops of the tincture of veratrum viride every three hours. His pulse, which counted 90 one hour after the accident, was kept at 58 to 60 beats per minute for four days, and it was exceedingly gratifying to notice how rapidly the bruises disappeared and how kindly the lacerations healed."

"In two cases of lacerated wounds of the scalp I had the happiest effects to follow the use of the veratrum viride. In fractures I ordinarily give it four or five days, and find that there is much less pain and swelling at the seat of injury than is ordinarily seen in those cases—the fractures uniting just as readily, and the patient's comfort greatly increased thereby. After surgical operations, where I wish to avoid inflammation and promote union by the first intention, I ordinarily resort to the veratrum viride."

The following case is similar to some that have come under the knowledge of the committee, which may be cited as cases of overdosing or poisoning—but, *however severe and alarming the symptoms, no well-authenticated cases of death have occurred;* on the contrary, it has happened that the overaction has proved a crisis in the complaint, and the patient rapidly recovered from that time. If the reader has observed any *fatal case* of poisoning by the veratrum viride, the committee would be much obliged to him to furnish an account of the same.

"CASE IV. A little girl, about four years of age, labouring under convulsions from congestion of the brain. Pulse 120. Applied cold to the head, and gave one and one-half drops of the tincture of veratrum viride every hour. Three doses were given when she broke out into a profuse cold perspiration, and all the symptoms of prostration. Her friends thought her dying, and sent for me. I did not arrive there until two hours after I was sent for, that is, in about four hours and a half from the time she was first seen. Instead of finding her dead, she was lying upon the bed, playing with a doll, *perfectly relieved,* her pulse at 72 beats per minute."

"CASE V. In a case of pleuro-pneumonia, in a woman of about thirty years, I gave eight drops every two hours. After the fourth dose was taken, the patient fell asleep, and did not wake for six hours. Her pulse, which was at 95 beats per minute when she took the first dose, had fallen to 65 the next morning, and the pain had very much abated. In four days she was able to be about, having had her pulse kept at between 60 and 70 beats per minute during that time. At my second visit it was ascertained that the patient had not taken her medicine since she awaked, for the simple reason that her little girl (two and a half years of age) had gotten hold of the cup, in which it was contained, and drank its contents all up. I was startled; the child had swallowed *thirty-two drops of the tincture of veratrum viride at one dose.* On looking to the opposite side of the room, where she was busily engaged with her playthings, I remarked that I presumed she had not kept it down a great while; the reply was, that 'it was no sooner down than up again.'"

Dr. Bishop has also derived excellent effects from the veratrum viride in pleurisy, pneumonia, scarlet and remittent fevers, measles, asthma, convulsions, ovaritis, metritis, and caked breasts, and in fact in most cases where a sedative and relaxant was required. He is satisfied that with proper precautions against its prostrating effects it may be safely used, and that it is a very valuable addition to our list of arterial sedatives and antiphlogistic remedies.

The committee would tender their thanks to the gentlemen who have reported their experience as given above. They only regret that more did not respond to their call, and if the results, obtained by those who have kept silence, do not accord with the published record, they hope that such will report their differences without delay. But the time has most surely gone by when the value of the veratrum viride, as a medicinal agent, is to be regarded as hypothetical. It has been used by thousands of physicians fully competent to make observations with discrimination and sound judgment. The strongest and most conclusive testimony relative to its great value comes from those who have used it the most, and who are, therefore, the best prepared to express an opinion.

Some of them feel as though they could not get along without it, especially in view of the fact that with it they have saved patients whom they think they must have lost without it. But there are others who will not believe in its value, and make a fair trial of it. They either sneer at it, or pretend to be afraid of so potent an agent. And yet, among all the cases that have been recorded throughout this whole country, can a single instance be mentioned where serious harm has been wrought by its use? Of which of our other potent remedies can this be said? The failure or success of this or any other medicine, in a single case, proves nothing for or against it. It is the result of repeated trials that is to establish its value and certainty of action. Nevertheless there are men who, having used it with trepidation and misgivings in one or two cases, without seeing the effects ascribed to it, have thrown it aside, and pronounced it worthless. But it matters little who now remain sceptical in respect to the great value of the veratrum viride as a medical agent. It has been used extensively, and has vindicated the reputation given it, to the satisfaction and admiration of intelligent men all over the country, and supplied a want that nothing hitherto has done.

It seems not inappropriate in closing this paper to make mention of the fact that the thanks of our medical brethren have been freely and cordially bestowed upon this District Society, for the noble efforts—as they are pleased to call them—that we have made to bring what is now proved to be an exceedingly valuable remedy, properly before the profession. Let us accept these expressions alike honourable to those who bestow them and to us upon whom they are bestowed. May the consciousness that our efforts to benefit our noble profession have been appreciated and acknowledged, excite in us the honourable ambition of doing what we can to alleviate the sufferings and to restore to health those who may be called to beds of pain and languishing. *Would it not be pleasant to each of us to know, while toiling amid our daily cares and labours, that our names would be remembered with gratitude and honour for the good we had done to our race, while our bodies are quietly resting beneath the green turf of the valley?*

Addendum.—The closing phrase of this paper may be read with more interest when it is known that the remains of the writer, Dr. Truman Rickard, now sleep beneath the "turf of the valley" of which he spoke. He died August 8th, 1861, aged forty-seven years, a Christian, a scholar, and good citizen.

Woburn, August, 1861.

Art. VI.—*On the Detection of Strychnia as a Poison, and the Influence of Morphia in disguising the usual Colour-test.* By John J. Reese, M. D., of Philadelphia.

The progressive increase in the number of deaths, within the last few years, occasioned by strychnia, used either for homicidal or suicidal purposes, is a subject demanding the careful consideration both of the toxicologist and the medical jurist; and every circumstance connected with the detection of this most potent agent cannot fail to interest the medical profession at large.

I have lately had occasion to investigate this subject very closely, in connection with a case of alleged poisoning by strychnia. A man was indicted for the murder of his wife, before the Court of Oyer and Terminer of Perry Co., Pa., at the April term of the present year. The woman died in December, 1860. Although the circumstances of her death were such as to excite suspicion at the time, no examination of the body was made until six weeks had elapsed, when the feelings of the community appear to have become sufficiently aroused to demand an investigation. The body was accordingly disinterred, and the examination was conducted by several respectable physicians of the place. They found the body still in a good state of preservation, but very rigid. The lungs were deeply engorged with dark blood, which escaped very copiously when they were cut into. The heart was healthy (although it was attempted to prove subsequently in the defence, that the woman was subject to cardiac disease); it was not empty and contracted, as has sometimes been found under similar circumstances, but it contained a considerable quantity of blood. The brain and spinal marrow were not examined, which is to be regretted, inasmuch as these organs are almost uniformly found congested in cases of death resulting from strychnia. The stomach and a portion of the small intestine were carefully tied, and along with the adhering pancreas, were reserved for a chemical analysis. The removed viscera were brought to Philadelphia, and I was requested to undertake the examination, which I commenced just eight weeks after the death of the subject.

I found the stomach but comparatively little changed in appearance, considering the length of time elapsed since death. Its lining membrane was healthy, with the exception of a few dark congested spots. There was neither ulceration, softening, nor erosion of the membrane. The same is true also of the fragment of intestine examined. The contents of the stomach and bowel consisted of about four or five ounces of a thick, brownish, homogeneous fluid.

The chemical examination was conducted with scrupulous care. I made *three* separate analyses—one of the contents of the stomach, one of the contents of the intestine, and a third of the tissues themselves; and each one of these was repeated a second time, so as to avoid all possible error. Yet I entirely failed to detect any evidence of the presence of strychnia, either by the bitter taste of the final extract, or by the very delicate *colour-test* employed.

Now, inasmuch as all the *moral* circumstances connected with this case (as elicited in the subsequent trial), as well as the symptoms attending the woman's death, clearly pointed to poisoning by strychnia, I felt desirous of ascertaining if there was any adequate cause which might satisfactorily explain the failure to detect the poison. In the first place, as is very well known, it is, as a general rule, more difficult to detect the presence of an *organic* poison in the stomach than of a mineral poison. For example, arsenic, antimony, or mercury may almost always be discovered with absolute certainty, even long after death, provided the individual had not survived long enough after taking the poison to allow of its total elimination from the system—a period averaging about two weeks. This is not the case, however, with an *organic* poison, either vegetable or animal. The alkaloids, especially, are known to undergo very rapid absorption from the stomach, and elimination from the blood. In their passage through the system, it is quite reasonable to suppose, from their complex nature, that they follow the general law of chemical decomposition; and that, unless searched for very soon after administration, the likelihood of detecting them would be extremely small. Now the case before us was just of such a character. The individual survived five or six hours after swallowing the alleged poison—an unusual length of time; again, a period of eight weeks elapsed after death before the chemical examination was undertaken. And we have the highest authorities for believing that organic poisons do undergo change in the body, *after* death.

There was, however, one other circumstance connected with the case, which to my own mind was of especial interest and importance—namely, the fact that the woman had taken, just before death, by the advice of her medical attendant, *a quarter of a grain of morphia* with a little ipecacuanha; but that she did not vomit. Now, the value of this fact is just this: it has been ascertained that the presence of morphia and other substances has the effect of disguising, and entirely neutralizing the usual *colour-test* used for detecting strychnia; so that, although the latter might be undoubtedly present, yet, if morphia were also present at the same time, the strychnia could not be discovered. It will be readily admitted that this is a point of the extremest importance to be settled by the chemist, in medico-legal researches. It is one to which no very especial attention has hitherto been given. It is merely mentioned as a casual fact in the various works on toxicology, but the only actual experiments recorded, to my knowledge, are those published by Dr. T. G. Wormley, in the *Ohio Med. and Surg. Journal*, for September, 1859, in which it is stated that, when the morphia *exceeds* the strychnia in quantity, the possibility of discovering the latter by the colour-test diminishes. The author himself lays no particular stress upon the fact. I accordingly undertook a series of experiments for the purpose of more accurately determining, if possible, this very important subject, and with the following results:—

Experiment 1. One-tenth of a grain of pure strychnia was added to about twelve ounces of water, into which were put several ounces of fresh beef, finely cut up, together with some starch, a little common salt, and a few drops of acetic acid; (the object being to represent, as closely as possible, the contents of a human stomach after a meal.) The whole was digested on a sand-bath for 12 hours at a moderate heat. It was then strained, pressed and filtered; and afterwards evaporated down to a very small bulk. It was next divided into two separate portions, each of which, of course, would contain the $\frac{1}{20}$th of a grain of strychnia. One of these portions was treated after the process known as Graham and Hoffman's (the alkaloid being removed by animal charcoal, and finally extracted by ether). Here, a drop or two of the ethereal solution, representing about the 1-40,000th to the 1-50,000th of a grain, gave distinct evidence of strychnia by the usual colour-test. The second portion of the evaporated solution was divided into two parts, each of which would of course contain the $\frac{1}{40}$th of a grain of the alkaloid. The first of these was treated according to the process of M. Staäs, in which ether is used as the ultimate solvent: and the second part after the process of Mr. Prollius, in which the ultimate solvent was chloroform. In both instances I obtained the most satisfactory proofs of the presence of strychnia; operating upon a single drop of the fluids—which would represent, certainly, not over the 1-100,000th of a grain of strychnia.

Expt. 2. This was a repetition of the former experiment, except that the quantity of strychnia used was much smaller—only the $\frac{1}{100}$th of a grain. After treatment by Staäs' process, and on concentrating the ultimate ethereal solution, the presence of strychnia was manifested both by the colour-test, and by the bitter taste of the extract. Here, the quantity of the poison operated upon was less than the 1-100,000th of a grain.

Expt. 3. This was an exact repetition of Expt. 2, except that to the $\frac{1}{100}$th of a grain of strychnia, three times that quantity of morphia ($\frac{1}{33}$d of a grain) was added. On treating this by Staäs' process, as in the preceding cases, I could not discover the slightest trace of either strychnia or morphia, even after the ultimate ethereal solution was concentrated to a very small bulk by evaporation.

Now, from the first two experiments just mentioned, in which the processes used were the precise counterparts of those employed in the analysis of the stomach, I think I am justified in concluding that these processes were extremely delicate and reliable: and that if the poison had been present, even in so minute a quantity as the $\frac{1}{100}$th of a grain, it ought to have been discovered, unless its presence had by some means been concealed. The *third* experiment would seem to prove, most unequivocally, that morphia, when present in excess, along with strychnia, has the property of so concealing the latter, as to render it impossible to detect it by the usual chemical test.

Expt. 4. This was also a repetition of Expt. 2, except that to the $\frac{1}{100}$th grain of strychnia, the $\frac{1}{50}$th grain of morphia was added instead of the $\frac{1}{33}$d—or double instead of treble the quantity. Here, likewise, there was a total failure to discover the poison.

Expt. 5. This was a repetition of the last, except that only $\frac{1}{100}$th grain of morphia was added to the $\frac{1}{100}$th grain of strychnia, or an equal portion. The result here was that I obtained the faintest possible evidence of the presence of strychnia, and only after repeated trials.

From these last experiments I think we may conclude that *the influence of Morphia in preventing the detection of minute quantities of Strychnia, in the presence of an organic fluid, depends upon the relative quantity of the two alkaloids;—the Strychnia being not discoverable when the Morphia is in excess, and barely discoverable when in equal quantity.*

I next instituted another set of experiments, with a view of ascertaining the effect of morphia in disguising the presence of strychnia *in perfectly pure solutions*—that is, entirely free from all organic mixtures. I purposely made use of extremely minute quantities of these substances, inasmuch as I was desirous of drawing correct inferences, which might be applicable in testing for the smallest quantities of the poison existing in the stomach. The general results of these experiments are interesting, and somewhat curious, as exhibiting the fact, that not only is the difficulty of detecting strychnia greatly increased by increasing *the proportion* of morphia, but that the *actual amount* of strychnia that can be discovered is nearly in an inverse ratio with the amount of morphia used. For instance, when the proportion of the two alkaloids was *one to one*, I was able to detect as minute a quantity as the 1-500,000th of a grain. When the proportion was one of strychnia to two of morphia, the smallest discoverable amount was about the 1-300,000th of a grain. When the proportion was *one to three*, the quantity discoverable was the 1-150,000th of a grain. When *one to four*, the minimum quantity was about the 1-100,000th of a grain. When *one to five*, the minimum quantity was 1-80,000th of a grain. When the proportion was *one to ten*, the smallest quantity discoverable increased to the 1-10,000th of a grain: and when the proportion was as high as *one to twenty*, the quantity rose to the 1-5,000th of a grain. Beyond this I did not pursue my experiments, as I was satisfied as to the general results. Dr. Wormley's observations, as recorded in the paper already quoted, go to show that the detection of strychnia, in the presence of an excess of morphia, is really more difficult when the amount of both alkaloids is very large, than when it is comparatively small; thus, he states that, when he experimented on one part of strychnia with one-and-a-half of morphia, in a large quantity, "the reaction" of the colour-test "is just perceptible." One part with two of morphia gives "but a mere trace" when the quantity of strychnia is as large as the $\frac{1}{30}$th of a grain. One part with three of morphia gives "no reaction" when the quantity is large.

But the important point was to determine how a quantity, almost infinitesimal, might be affected by an amount of morphia, which, though small in itself, yet bore a relatively large proportion to strychnia; just precisely such a state of things as would be likely to be met with in an analysis of the human stomach.

In connection with the foregoing experiments, and with the view of still more closely testing the question of how far the presence of morphia would operate in disguising strychnia, when both had been present in the stomach of a living animal, I administered the poison to three half-grown cats, with the following results:—

Half a grain of pure strychnia was given to the first animal, and in eleven minutes it died in a violent convulsion. The poison was very easily discovered in its stomach, by the usual tests, on the following day. To the second animal a quarter of a grain of strychnia and the same quantity of morphia were given; and, somewhat to my surprise, the animal was deeply convulsed in six minutes, and died very quickly. Here the morphia, so far from counteracting the toxic influence of strychnia (as might have been inferred from its opposite physiological influence), seemed actually to have increased its effects.[1] The stomach of the second animal was likewise examined, but I obtained scarcely recognizable evidence of strychnia, owing doubtless to the influence of the presence of the associated morphia. It will be recollected that the quantity of morphia in this case was just equal to that of the strychnia. To the third animal, the $\frac{1}{20}$th of a grain of strychnia, and the $\frac{1}{10}$th of a grain of morphia (double the quantity) were administered. Convulsions took place in about fifteen minutes, and death in half an hour. The stomach was examined by Staäs' process, as in the other cases, but with a total failure to detect the poison by the colour-test; although the bitterness of the extract, and its decided action in producing tetanic convulsions in a number of frogs, clearly established its presence.

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[1] This fact is in accordance with the observation of Bernard, in relation to the effect of the woorara poison not counteracting, but rather increasing the violence of the poisonous action of strychnia, although these two substances, separately, possess such opposite physiological properties—the one being a powerful neurotic excitant, the other an equally powerful depressant. It must be remembered, however, that another high authority, M. Vella (*Comptes Rendus*, t. lx.), makes an opposite assertion to that of Bernard; he contends positively for the antagonism of the two poisons.

The experiments of Drs. Hammond and Mitchell (Experimental Researches on Corroval and Vao, by Wm. A. Hammond, M. D., and S. Weir Mitchell, M. D.; *Am. Journ. of Med. Sci.*, July, 1859), on *corroval* and *vao* (supposed varieties of curara, though differing from it in some physiological points) seem rather to sustain Bernard's views on this point. When either of these substances was administered, along with strychnia, to frogs, they did not neutralize each other, but the peculiar impression of both poisons was produced.

From all the foregoing experiments, it appears to be conclusively established that morphia does unquestionably possess the power, when present in excess, of completely disguising the usual colour-test of strychnia; and this is emphatically the case when they are associated in organic mixtures, as in the contents of the stomach. Consequently, this fact should always be taken into the account, in medico-legal investigations.

In making the foregoing statement, I regret to find that I differ from so high an authority as Prof. Guy, of King's College, London, who has communicated a valuable paper "On the Colour-tests for Strychnia, &c.," in the *Chemical News* of July 6, 1861. While discussing the question of the effect of the presence of other bodies on the colour-test, this author states, as the result of his experiments made with a great variety of substances—vegetable, animal, and mineral, and including all the matters that would be likely to remain mixed with strychnia when extracted from the contents of the stomach, or from the fluids and tissues of the body—"that the colour-tests are little, if at all, affected by such admixtures."

Now, I feel assured that Dr. Guy could not have experimented on a mixture of strychnia and morphia, or he would have arrived at a different conclusion *in this one instance.* Indeed, he does not enumerate *morphia* among the substances tried by him in association with strychnia, as it probably did not occur to him to employ such a mixture.

So thoroughly was my own mind convinced upon this point, that I felt conscientiously bound to give it in evidence, on the trial of the prisoner, when I was interrogated as to "what causes might prevent the detection of strychnia in the stomach?" As I have already mentioned, the chemical analysis had entirely failed to establish its presence; nor could I discover the slightest bitterness of taste in the ultimate extract. Nevertheless, the prisoner was convicted of murder, probably on the very strong *moral* evidences of his guilt, and was sentenced to execution in spite of the most persistent assertions of his innocence. I have since learned, however, that he subsequently made a full confession of the crime.

It may not be out of place, in this connection, to refer to the most approved methods of testing for strychnia, and also to indicate their relative value. Among the various chemical tests which have, from time to time, been proposed, the only one to which I shall here allude, as entitled, beyond all comparison, to the pre-eminence, is the *colour-test.* This name has been most appropriately given, on account of the beautiful play, or succession of colours, produced when certain oxidizing bodies are brought in contact with strychnia, in the presence of sulphuric acid. The substances usually employed for this purpose are the peroxides of lead and manganese, bichromate of potassa, ferricyanide of potassium (red prussiate), and permanganate of potassa. While these agents, in conjunction with sulphuric acid, will yield up oxygen to organic substances generally, the alkaloid Strychnia is the only body known which, under the circumstances just mentioned, will exhibit the beautiful *play of colours* already alluded to. When, for example, a small fragment of strychnia is placed upon a white porcelain plate, and a drop of strong sulphuric acid is added, and then a small portion of any of the oxidizing bodies above enumerated is stirred in with it, a beautiful rich violet-blue colour will be given, which very soon changes to a mulberry-purple, and ultimately to a light red tint.

This play of colours, *under the conjoined agency of the oxidizing body and sulphuric acid*, is quite peculiar to strychnia; and, so far as is at present known, it is possessed by no other substance whatever. I will not now stop to discuss the various objections that have, at different times, been urged against the *certainty* of this test. One answer will dispose of them all, namely, that, whilst there are undoubtedly other organic principles, such as morphia, veratria, delphia, salicin, anilin, pyroxanthin, the woorara poison and others, which do yield a colour—sometimes even of a purplish cast, with sulphuric acid *alone*, there is not a single one that will strike the peculiar blue tint with the acid and the oxidizing body *conjointly*. Strychnia alone possesses this peculiarity; and I have no hesitation in regarding this so called colour-test, when carefully applied, as positive and as infallible as any other which the chemist is accustomed to employ, and upon which he ordinarily relies. I am aware that some may be disposed to question the *exclusiveness* of this assertion, and will cite the woorara (curara) poison, and its alkaloid curarina, as an exception. It is true that so distinguished an authority as Dr. Taylor, in the last edition of his work on Poisons (Am. ed., 1859, p. 680), inadvertently makes the statement that curarina resembles strychnia "in giving the peculiar play of colours when treated with sulphuric acid and one of the oxidizing bodies;" but he grounds this statement on a mistranslation from Pelikan, as has been clearly shown by Prof. Guy (vid. *Chem. News*, July 6, 1861). Besides, these two substances differ further in the fact, that whilst sulphuric acid alone gives with curarina (according to Bernard and Reynoso), a rich carmine tint, it causes no change of colour whatever with pure strychnia.

The next point to be briefly noticed is the extraordinary *delicacy* of the colour-test. It is this which gives to it its chief value. As the result of a great number of experiments made for this purpose, I have been enabled to detect with distinctness a smaller quantity than the *half-millionth* part of a grain (the precise amount was the 1-672,000th of a grain); and on some occasions, when experimenting on as minute a portion as the *one-millionth* of a grain, I have obtained a momentary flash of the peculiar blue colour —faint, to be sure, but to the practised eye positive and real.

It is to be understood that these minute quantities of the poison can be discovered only when it is in the pure state, and free from all other organic admixture. Of course it would be in vain to attempt to detect anything like such infinitesimal portions in mixtures like the contents of a stomach. But as I have already shown, there is no difficulty of discovering as small a quantity as the *one-hundredth of a grain* (and doubtless even less), when diffused in a pint of complex organic mixture.

I will add a few words in relation to the best mode of proceeding, when we desire to test for extremely minute portions of pure strychnia.

A solution is first made of any given quantity—say one-tenth of a grain in a fluidounce of distilled water, with a few drops of acetic acid to insure solution. The number of drops contained in the portion of liquid is to be ascertained by means of a pipette, prepared by drawing out a glass tube to a fine point. The solution may then be diluted to any degree required. One drop of the liquid, representing the ascertained fractional part of a grain, is then to be placed upon a small, perfectly clean white porcelain capsule; and evaporated to dryness, either in the sun or by a very gentle heat. When cold, a drop of pure sulphuric acid is to be placed, by means of a glass rod, on the capsule alongside of the dry spot, but not in contact with it. Next, a small crystal of bichromate of potassa (or, preferably, of ferricyanide of potassium) is to be laid on the dish; after which, a clean, dry and finely-pointed glass rod should be drawn through the drop of acid so as to bring a very little of it in contact with the spot; the little crystal is next to be moved by the rod once or twice over the moistened spot, when there will immediately appear, flashing out, as it were, the characteristic blue colour—more or less transient, according to the amount of the alkaloid present, and passing through the usual tints.

It may appear to some that I have been unnecessarily minute in describing the details of what seems a very simple experiment; but I can assure such that a successful result can only be obtained, when operating upon such extremely small quantities, by the strictest attention to these details. For example, too high a temperature in the evaporation may decompose the minute quantity of strychnia, which, however, must be perfectly dry; again, the sulphuric acid should be pure and strong; for this purpose the drop should be taken by means of a glass rod out of the bottle, and *not dropped* from its rim, as it would, in the latter case, be apt to have become somewhat diluted from moisture absorbed from the atmosphere. Again, the fragment of the crystal used should be very small—one or two lines in dimensions; it should be free from all adherent powder, so as not too soon to dissolve in the acid, and thereby conceal the true colour. For this reason I decidedly prefer the ferricyanide to the bichromate, when manipulating with very minute portions of strychnia: it is much less apt to colour the acid. Lastly, the experimenter must avoid using too much acid; hence the direction to draw only a *portion* of the drop over the strychnia spot, by means of a pointed glass rod. By carefully observing the above directions, and by a little practice, any one may soon acquire sufficient dexterity in manipulation to bring out very satisfactory results—results far exceeding the most delicate tests usually employed in inorganic chemistry, if we except the beautiful and truly wonderful analyses of Bunsen and Kirchhoff, within the present year, founded on the coloured lines of the spectrum, by means of which even the 1-200,000,000th of a grain of sodium was detected, and which led to the discovery of the new alkaline metals *cæsium* and *rubidium*. This method, however, is optical rather than chemical. Both results exhibit proofs of the extreme divisibility of matter.

Another very beautiful and scientific means of bringing out the colour-test for strychnia has been proposed by Dr. Letheby. (*Lancet*, June 28, 1856.) Ascertaining that it was the nascent oxygen which acted upon the alkaloid and developed the peculiar colours, he employed the agency of galvanism in the place of one of the oxidizing bodies. His method of proceeding is as follows: A drop of the strychnia solution is placed in a cup-shaped depression made in a piece of platinum foil. After evaporating to dryness, the spot is moistened with a drop of strong sulphuric acid. The foil is then connected with the positive pole of a single cell of Groves' or Smee's battery, and the platinum terminal of the negative pole is made to touch the acid. Instantaneously the blue colour flashes out with remarkable beauty and brilliancy. I have repeatedly performed this experiment of Dr. Letheby, and can testify to its good result in portions of *pure* strychnia as small as the 1-50,000th to the 1-100,000th of a grain; but it entirely failed in my hands to detect those *extremely* minute portions which I have before alluded to, as being discoverable by the conjoined use of the ferricyanide of potassium and sulphuric acid. Moreover, I think it open to this objection, especially in the hands of the inexperienced, namely, that all those substances which yield a colour with sulphuric acid *alone*, develop a much richer and deeper colour when subjected to the above-mentioned galvanic test; and this, in some cases, might be readily confounded with an *imperfectly developed* strychnia colour. Thus, in my own experiments with the galvanic test, delphia afforded a rich reddish or purplish-brown tint; veratria, a rich carmine, approaching to violet; salicine, a colour much resembling the last; aconitia, a rich brown; piperine, a rich orange-brown, &c. &c. All of these colours, *including the blue of strychnia*, will change to a deep brown, approaching to black, if the platinum terminal of the negative pole of the battery is kept in contact with the foil *through the acid*. The negative terminal should only touch the drop of acid, and *not* the foil. This circumstance alone is, I think, calculated to detract from the value and certainty of what otherwise is a beautiful and scientific test. Moreover, I was unable to succeed any better by this means, in discovering small quantities of strychnia when combined with an excess of morphia, than when I employed the usual colour-test. In fact, it was much less effective; for I was unable by its means to discover the 1-20,000th of a grain of strychnia combined with 1-10,000th of a grain of morphia (double the quantity); whilst with the ordinary colour-test, as already mentioned, I could detect as small a quantity as the 1-300,000th of a grain, when associated with double that amount of morphia.

Along with the colour-test, and confirmatory of it, I must not omit allusion to the extreme *bitterness of taste* possessed by strychnia. In truth, it may confidently be asserted to be the *most* bitter substance known—as shown by the following observations, made with a view of comparison with some other well-known bitter articles:—

One grain of strychnia was dissolved in five gallons of water; a single drop of the solution, containing less than 1-500,000th of a grain, afforded a distinct bitter taste.

One grain was dissolved in ten gallons of water; a few drops held in the mouth for a moment or two produced a very perceptible bitter taste.

A third experiment still more strongly illustrates this property: A solution was made of one grain in twenty-five gallons of water; here, one drop represented less than the 1-2,500,000th of a grain. On rinsing the mouth forcibly with a portion of this solution, a faint though distinct bitter taste was perceptible. In fact, so intense and permanent is the bitter taste of strychnia, that this quality may be regarded as affording a good corroborative proof of the presence of the poison. So true is this, that I doubt if it is possible to obtain the *colour-test* in any case where the evaporated extract affords no bitter taste. Hence, its great value in medico-legal researches.

The results of experiments on other bitter substances are as follows:—

Extract of quassia came next to strychnia; its limit was a drop containing 1-358,000th of a grain—equivalent to a solution of one grain in three and a half gallons.

Carbazotic acid, aloes, and *extract of colocynth* were next in order; they all possessed about an equal degree of bitterness. One drop of a solution containing a grain to two gallons, and representing a little over the 1-200,000th of a grain, afforded a slight bitter taste.

Sulphate of quinia yielded a perceptibly bitter taste in as small a quantity as the 1-125,000th of a grain—equivalent to a solution of one grain in a little over a gallon.

Picrotoxine was slightly inferior to quinia in bitterness; the 1-100,000th of a grain may be taken as the appreciable limit.

The *salts of morphia* were vastly inferior to any of the foregoing in point of bitterness; the limit being the 1-7,000th of a grain—equivalent to a solution of a grain in half a pint of water.

I also performed a series of experiments with a view of determining the comparative value of the so-called *physiological* or *frog-test*, first noticed by Dr. Marshall Hall. There are several methods of employing this test; one is to immerse the body and hind legs of the frog in the strychnia solution; when, after a shorter or longer time, depending upon the strength of the solution and the size of the animal, tetanic spasms will be produced, owing to the poison absorbed. A second method is to inject a few drops of a solution of known strength into the subcutaneous tissue of the thorax or abdomen of the animal. A third mode is to inject a similar solution into the stomach through the œsophagus. Either one of these methods will afford satisfactory results. The first one, or that by cutaneous absorption, was, I believe, that adopted by the distinguished discoverer; and as I found it a very convenient one, I also followed it in my own experiments.

The extreme susceptibility of the frog to the influence of strychnia is truly remarkable. Long known as affording us one of the most delicate indications of the galvanic current, so as to be esteemed pre-eminently *galvanoscopic*, this little animal would appear to be no less sensitive to the action of the subtle poison now under consideration, so that it merits with equal propriety the appellation of *strychniascopic*.

In experimenting with frogs with a view to determine the presence of strychnia in minute quantities, it is advisable to make use of very small animals—those, for example, whose bodies measure from an inch to an inch and a quarter in length, and which would weigh from twenty-five to fifty grains. The simple method which I adopted, and which I found to answer extremely well, was to put a small quantity of the strychnia solution—about a fluidrachm, or even half that quantity—into a deep conical glass vessel, such as an ordinary pint graduate measure, and then place the frog at the bottom. The shape of the jar insures the required immersion of the hind legs and body of the animal in the liquid, while the head remains perfectly free for breathing. Any efforts to escape are usually prevented by the sides of the vessel; or, if necessary, it should be pushed down again into the fluid—the object being to insure continuous contact. The subjoined experiments were undertaken by me with the twofold view first, of comparing the value of the frog-test with the other strychnia tests; and secondly, of ascertaining if the presence of morphia would produce any modification of the usual effects of strychnia on the frog.

Experiment 1. A frog weighing 45 grains was put into a solution of strychnia, one drop of which contained the 1-13,500th of a grain—(equivalent to about one grain in twelve fluidounces.) Convulsions were produced in four minutes.

Expt. 2. A solution of one-half the strength of the preceding (or one grain n twenty-four fluidounces) affected a frog weighing 40 grains in five minutes.

Expt. 3. A solution of one-half the strength of Expt. 2 (or one grain in forty-eight fluidounces, or three pints) produced spasms in a frog weighing 28 grains n five or six minutes.

Expt. 4. A solution of one-half the strength of the last (or one grain in six pints) affected a frog weighing 35 grains in eight minutes. In this case the animal was immersed only five minutes, and subsequently recovered. In the former instances they very soon died.

Expt. 5. A solution of one-half the strength of that used in Expt. 4 (or one grain in twelve pints) produced the tetanic spasms in fifteen minutes. In this case also the animal recovered.

Expt. 6. A solution of one-half the strength of the preceding (or one grain in three gallons, in which one drop represented the 1,430,000th of a grain) produced no effect on one frog after an immersion of twenty minutes; but in another, weighing 29 grains, after half an hour's immersion, decided convulsions were exhibited, and the animal suddenly died. Beyond this, I did not deem it necessary to proceed in my investigations, fully satisfied with the result; though doubtless a still more minute quantity might be shown to affect a very small animal. It may, I think, be safely affirmed that a solution containing as small a portion as the *half-millionth of a grain to a drop* may thus be recognized.

These experiments, more especially the last, illustrate very satisfactorily the extreme delicacy of the frog-test for strychnia; for certainly only a very minute portion of the poison—an almost infinitesimal quantity—could have been absorbed through the animal's skin, in the limited time mentioned. I will cite one additional experiment, under this head, which, to some, may probably appear still more conclusive:—

The 1-500th of a grain of strychnia was put into the mouth of a middling-sized frog: death took place, preceded by the usual spasms, in about twenty minutes. The abdominal viscera were removed, and treated after Staäs' process. The ultimate ethereal extract was very slightly bitter, but afforded no perceptible colour-test. On dissolving this extract in water, the solution produced the most decided tetanic convulsions on three healthy frogs, averaging 100 grains in weight each. A portion being injected beneath the skin of one, brought on twitchings in four minutes, resulting in death: a second, treated in a similar manner, was convulsed in ten minutes, but recovered: the third was simply immersed in the solution, and a small portion injected into the stomach, with the effect of producing spasms, from which, however, the animal recovered.

As a *corroborative* evidence of the presence of strychnia I should regard the frog-test as one of great importance, and one which ought never to be omitted in medico-legal researches. Taken in conjunction with the delicate colour-test already alluded to, and the bitter taste of the evaporated extract, it affords such overwhelming proof of the presence of strychnia as can admit of no possibility of cavil.

Being desirous, in the next place, of ascertaining if the presence of morphia (which I had found produced such a decided influence on the colour-test) would occasion any modification in the frog-test, I made the following experiments:—

Experiment 1. A frog weighing 29 grains was immersed in a solution containing one grain of strychnia and two grains of morphia in twenty-four fluidounces of water. Convulsive movements commenced in four minutes. Here, the proportions were one of strychnia to two of morphia.

Expt. 2. A frog weighing 40 grains, on being immersed in a solution containing half as much strychnia, but twice as much morphia, as in the former experiment (the proportion being one to eight), exhibited spasms in five minutes.

Expt. 3. A frog weighing 100 grains was immersed in a solution containing one grain of strychnia and twelve grains of morphia in forty-eight fluidounces of water. It exhibited the usual tetanic symptoms in fifteen minutes.

Expt. 4. A frog weighing 35 grains was immersed in a solution containing one grain of strychnia and thirty-two of morphia in six pints of water. It was affected with tetanic spasms in twenty minutes; another, rather smaller, was affected in five minutes.

Expt. 5. A cat was poisoned by taking one-twentieth of a grain of strychnia and one-tenth of a grain of morphia (double the quantity): convulsions and death took place in about thirty minutes. The stomach was, on the next day, analyzed by Staäs' process. The ethereal solution, although concentrated, totally failed to yield the colour-test (as already mentioned), but the extract possessed a slightly bitter taste, and its watery solution produced the most decided convulsions (generally resulting in death), in *eight* distinct frogs, averaging 100 grains each. Some were merely immersed in the liquid; to others, it was administered either by injecting into the stomach, or under the skin.

It is abundantly evident from the above experiments, that very little, if any, effect is produced by morphia in modifying the influence of strychnia upon frogs; consequently, the presence of morphia, although most seriously interfering with one of our means of detecting this poison, viz., the *colour-test*, most fortunately produces no impression on the almost equally delicate *frog-test*.

Since making these very delicate experiments with frogs, I have regretted that I was unable to apply this test in the poison case mentioned at the commencement of this paper; but I was unfortunately unable to procure any frogs of the proper kind in the winter season, when the examination was made.

Before concluding this already lengthy paper, I will add a word or two in reference to the *microscopy* of strychnia—a subject which, I believe, has not heretofore been particularly noticed. Having ascertained the extreme delicacy of the other modes of testing for this substance, it occurred to me to examine minute portions by means of the microscope; and the results obtained were exceedingly beautiful and satisfactory. I have succeeded best by evaporating a drop of a solution in pure water, of known strength, on a glass slide, and subjecting it to the field of a good instrument. The solution must, of course, be perfectly pure, and free from all organic matters. Very satisfactory results may be obtained by using quantities as small as the 1-50,000th to the 1-500,000th of a grain; although even the 1-1,000,000th may easily be recognized. The appearance presented to the eye is that of numerous crystals, some acicular and others stellate and scalloped, intermingled with dentated crosslets; the whole bearing a striking resemblance to the appearance presented by the arborescent crystals of the triple phosphate seen in a drop of evaporated urine.

It is not pretended that we should rely on the microscopic appearance as a test for strychnia *per se;* it can only be employed as a corroborative proof; but its delicacy and its beauty should always justify its employment, so far as practicable; although it must not be forgotten that it is available only when the alkaloid is in a state of purity.

Art. VII.—*Successful Operation for Inguinal Hernia with the Testicle and Sac both above Poupart's Ligament.* By F. Taylor Bradford, M. D., of Augusta, Ky.

The unusual character of the present case, together with the mortality attending the operation for hernia, renders the discussion of the subject, as well as each individual case, a matter of peculiar interest.

Whilst *Amussat*, and his long list of followers, insist upon "subjecting the hernial tumour to continued pressure and kneading for *days* together," *Desault*, and his converts, teach us to "think favourably of a hernia which *has not* been *handled* before the operation."

"Has the practice of opening the sac had any influence on the great number of unfavourable results?"

Petit, *Le Dran*, *Munro*, *Sir Charles Bell*, *Bransby Cooper*, *Aston Key*, *Luke*, and *Gay*, say yes; *Dupuytren*, *Richter*, *Hey*, *Heister*, *Sir A. Cooper*, *Lawrence*, *South*, and *Hancock*, say no!

We are continually drifting to extremes, and it is only by the "*second sober thought*" that we may move steadily by the legitimate landmarks of safety.

The fact that a solitary instance here and there has yielded to the oft-repeated efforts by purgation, the taxis, and a long delay for the hopeful chances of nature, is not of itself *prima facie* evidence that the rule is founded in conservative surgery.

Those who have read the very excellent work of Mr. Hancock cannot come to any other reasonable conclusion than that the great fatality of hernia is owing, not so much to the operation, or the manner in which it is performed by good surgeons, as to the delay incident upon continued and repeated efforts by the taxis, purgation, and rough and repeated manipulation of the part. If my limited experience is worth anything in matters of this sort, it is this: Place the patient under the influence of chloroform, embracing as it does the advantages of venesection, tobacco, the warm bath, tartar emetic, opium, &c. &c.; then make an effort by the taxis, and if you do not succeed, the indications are pretty clear that you have neglected the proper position of the patient, the best means of reducing, or that an operation should be advised or performed. My only object in making these remarks is to guard the practitioner against a *common error* that days must be spent in efforts by purgation, taxis, &c. &c., until the reasonable hopes for a timely operation are gone. They are not made, however, with a view to the present case. It was in the hands of intelligent men, and from this fact, perhaps, more than to the manner of the operation, does its success depend.

The subject of the present interesting case was a negro man, aged 45, of good constitution, whose muscular development was most extraordinary; his remarkable feats of strength and muscular prowess rivalling perhaps anything of the kind in the State. He had a wife and several children. A few days previously he was shaving a *mall* with a draw knife, having one end against his belly; suddenly he complained of *colic pain*. I found him with swollen abdomen; sense of tightness across the lower part of the bowels; frequent desire to go to stool; inability to evacuate; occasional vomiting; hiccough; countenance anxious; pulse small, hard, and wiry. Immediately above *Poupart's ligament* was a large swelling, tender to the touch, slightly elastic, with a glossy cast as though it was oiled. The swelling was *peculiar*, and lay across the bowels, not perpendicular, measuring perhaps five inches in length. Upon examination of the *scrotum* only one *testicle* was found. When interrogated as to this state of affairs, he stated "*he never had had but one.*" He then stated that twelve years before he had suffered in the same way, and after a day or two a physician had got his bowels acted on, and said he had reduced the bowel. But from that time up to the period of this attack "*he had always had a lump there;* it never had gone away."

Drs. Duke and Sharp, of Maysville, and Taylor and Cartwell, of Washington, were in attendance; they had used the most efficient and prudent means to reduce the supposed strangulated bowel without effect. The known ability of these gentlemen, and the time which had elapsed, deterred me from further irritation of the part; but believing that the *testicle* lay above Poupart's ligament, and that inflammation of that organ at that point might give rise to a similar train of symptoms, and somewhat influenced by his former attack, I suggested the propriety of making a further attempt to move the bowels and delaying the operation a short time. It was cheerfully agreed to. The present condition and history of the case was the history of strangulation, *critically considered*, yet the former history of his attack, where the bowels had acted, influenced us to this conservative hope. The bowels, however, not being acted upon at the expiration of the time agreed upon, the patient was placed under the influence of chloroform, and the operation commenced. Taking hold of the integuments immediately over the tumour with the left forefinger and thumb, lifting them up slightly and guiding them up and down so as to be sure they were freed from the sac, I thrust the knife through the integuments with the back next the tumour, and cut directly upwards and outwards. This brought me near the sac, and of the remaining membranes (*intercolumnar fascia, &c.*) a little bit of each was pinched up by the forceps and cut into. A grooved director was then placed in the small *niche*, and each membrane carefully divided until the sac was reached. Its bluish transparent coat was divided like the former coats. The left forefinger was then passed into the neck of the sac; the stricture being found, the hernia knife (Le Gros Clark's) was passed up flat on the finger through the stricture, the edge then turned up, and the division made by a slightly *undulating* motion *directly* upwards—knife parallel to the *linea alba.*

The stricture was remarkably firm and tendinous, and was distinctly heard when divided by the knife. The sac contained a small quantity of limpid serum. A small portion of the bowel was of a deep purple hue, interspersed with spots, and a *knuckle* of an ash hue which gave rise to some uneasiness. The bowel being returned into the abdomen brought to view the *fugitive testicle* lying immediately under the sac. It was much smaller in size than the other testicle, but perfectly healthy in colour, and firmly adhered to its strange locality. I did not attempt to remove it. The wound was dressed in the usual way, and the patient recovered without much trouble.

Dr. Taylor and Dr. Cartwell are entitled to much credit for their faithful attention after the operation.

ART. VIII.—*Case of Internal Necrosis after severe Injury of the Thigh, with extensive Chronic Sub-periosteal Abscess; Operation; Cure.* By H. O. HITCHCOCK, M. D., of Kalamazoo, Michigan.

MR. P. V. W., aged 37 years, an architect and builder, presented himself at my office Nov. 15th, 1859, for examination and advice relative to his right thigh. He gave the following history: Five or six years ago, while raising the roof of a church in Hudson, N. Y., he received a severe raking injury in the right thigh, by the falling of heavy timbers upon its outer aspect. At the same time there was fracture and dislocation of the left ankle. A surgeon, soon in attendance, adjusted the fracture and dislocation, and "smoothed out" the muscles of the right thigh, which seemed torn from their origin and gathered in a heap under the skin. The injury was then considered only muscular.

A few weeks after the accident the patient began to suffer very severe pain in the right thigh, as if in the bone. This, he says, was considered and treated as a rheumatic pain for three weeks, when, choosing to die rather than be in such agony longer, the patient insisted that the attending physician should lance it. Two small openings were made on the posterior border of the biceps muscle, about midway of the length of the femur. These gave exit to a large quantity of sanious, watery pus, and afforded instant relief to the patient. These openings have never been closed, but continued, till the day I saw him, to discharge pus of the same description.

Six months after the accident, the patient was able to resume his employment, which he has since continued, though with much pain and great discomfort. While in the upright position, at first, but little oozing took place, but the lower half of the thigh would soon become swollen and painful "as if," in his own expressive words, a "dog were gnawing it." And when the abscess was nearly filled, every contraction of the muscles of the thigh caused the matter to flow from the sinuses. In hot days in the summer, this discharge was often immense, and at night he would close the labours of the day by evacuating the pus from the lower part of his thigh with the foot elevated.

Such had been his life for the past five years. He had lost much flesh and much of his spirit and energy. He was warned just before he came to my office, by a painful swelling of the inner condyle, that the disease was about to invade the knee-joint. Hence his application for advice.

The patient is a large well-developed man, with no taint of scrofula or syphilis, of a pale sallow complexion, with an anxious expression of countenance indicative of long-continued suffering. The sinuses were empty, and the probe followed them easily to denuded bone. But so straight and narrow were the sinuses, it was impossible to determine whether the instrument impinged upon a sequestrum or not. An exploratory operation was advised, to which he readily submitted, it being agreed, however, that any operative procedure necessary for cure should at once be completed.

On making an incision of ten inches in length between the biceps and vastus externus muscles, commencing one and a half inches above the knee-joint, the bone was found bare of its periosteum throughout almost the entire length of the wound, and more than one-half the circumference of the bone.

What might have been the periosteum, was thickened, jelly-form, and seemed covered with a smooth, shining membrane. The surface of the bone was granular and somewhat crumbly. This surface was chiselled off to the depth of one-eighth to one-fourth of an inch, until healthy tissue was reached. The gelatinous covering above was also removed as far as possible.

In the upper half of the middle third the femur seemed decidedly and somewhat abruptly enlarged, even to nearly twice its natural size. On searching with care, there was found a hole about one-fourth of an inch in diameter, leading directly into the centre of the bone. This also was filled with the same jelly-form substance as was noticed to cover the bone. The bone was at this point trephined, and the medullary cavity scraped as the surface had been. And I was gratified in withdrawing from the centre of the bone a sequestrum one inch long, one-third of an inch wide, by one-sixth of an inch thick. The clearing process was carried on till nothing but healthy tissue could be brought from the medullary cavity.

It should be remarked that the thickness of the bone at the point of trephining was fully three-fourths of an inch, and very compact and hard.

The wound was now well cleansed, and closed with a pledget of lint throughout its whole extent, to insure granulation from the bottom.

The patient was attacked in his weakness, by that most lupine of all diseases, ague. The progress of healing was very slow, and about six weeks after the operation the internal condyle became swollen and painful. This was laid freely open, and we found, on the inside of the thigh, a very extensive abscess with the same jelly-form lining, communicating at its upper part, over or anterior to the bone, and at its lower part, under or posterior to the bone with the exterior abscess. Astringent injections of zinci sulphatis gr. v, ad ℥, and hydrarg. bichlorid. gr. i, ad ℥, were used with the most gratifying effect, so that on the first of April the disease seemed wholly eradicated, and the wound almost entirely closed; and our patient entered upon a very large contract of heavy buildings, in better health and spirits, and more fleshy than he had been for five years. To-day, two months later, the wound is completely healed, and the leg seems perfectly sound.

This case presented to me some points of interest:—

1*st*. Was there not a fracture of the femur at the time of the accident, and hence the internal necrosis?

2*d*. Would not free incisions through the periosteum, at the time of the supposed rheumatic pain, have saved the patient from all the trouble of the sub-periosteal abscess?

3*d*. The value of a solution of bichloride of mercury as an injection in old sinuses and chronic abscesses.

4*th*. The fact that no periosteum will be formed to a large extent.

Kalamazoo, Michigan, June 1st, 1860.

TRANSACTIONS OF SOCIETIES.

Art. IX.—*Summary of the Transactions of the College of Physicians of Philadelphia.*

1861. *Feb. 6. Microscopic Structure of Diphtheritic Membrane.*—Dr. Stroud exhibited a diphtheritic membrane of tubular form taken after death from the air-passages of a child of ten years of age, who had died, after five days' illness, of diphtheria.

This specimen presented the usual appearance to the naked eye, but it had been carefully examined under the microscope by Dr. James Darrach, to whom Dr. Stroud referred for a particular description.

Dr. J. Darrach remarked that the membrane presented by Dr. Stroud exhibited, under the microscope, corpuscles and small round cells, with single nuclei like young epithelial, also granular matter. There was no appearance of fibrillation. In further illustration, Dr. D. then presented a specimen, removed from a chicken, exhibiting a deposit allied to that of diphtheria. The deposit was upon the mucous membrane of the sides of the mouth, underneath the tongue, upon the palate, and within the glottis, which had been entirely closed by it. The chicken, *no doubt*, died from suffocation. This chicken lived about eight days from the time when it was first noticed as sick, during which time it refused to eat, but drank a great deal of water. Since noticing the above, the Doctor has examined another chicken which died of the same affection. In this instance the whole nares were involved. The deposit, however, was found directly upon the rim of the glottis, and not within it. In neither of the above did the deposit extend below the glottis. What, perhaps, is worth noticing is, that all the children (some four or five) of the family which owned these chickens, had just recovered from diphtheria. This affection was also prevalent in the neighbourhood.

The Doctor mentioned that he did not wish it to be understood that he thought the disease of which this chicken died differed from one already recognized as occurring in poultry, from which the term croup was obtained. He stated that he lacked information on this point. At the same time he desired to direct the attention of the college to the close resemblance of this disease to the diphtheria in the human subject both as to the elements of the membrane and the locality affected by the exudation.

The Doctor made the following remarks upon the structure of the diphtheritic membrane. He was disposed to doubt that fibrinous exudation was a constant effect in diphtheria, or even in ordinary sthenic croup. This opinion was founded on observations made by himself and his brother, Wm. Darrach, Jr., during the epidemic of this disease in Philadelphia, in the winter of 1860.

He had examined a number of the patches of membrane, which were carefully removed during life, also others taken from cases after death.

The elements found in all these examinations were cells, young epithelial nuclear bodies, not affected by acetic acid, and, most likely, aborted epithelial cells, with pus-corpuscles and granular matter; the granules occasionally assuming a disposition to form themselves in parallel lines.

In no one case could be perceived a distinct fibrillation, as is easily recognized in the transudations upon the pericardium and other serous membranes.

If the fibrillation be not present, we have not the morphological element of coagulated fibrin; and, therefore, unless there be some chemical test by which it may be designated, we cannot predicate its existence under the microscope.

It is true that a granular form of fibrin has been described, but this has not been established.

Again, has not the existence of fibrin in some of the membranous patches of diphtheria, and in other affections of the mucous membrane, been rather inferred than demonstrated?

We have been taught and many still maintain that pus and other cell-elements are the direct product from an unorganized blastema termed fibrin; more especially has this been considered the origin of pus, at least with those who have given up the idea of its being a secretion.

The existence of these elements has led observers to predicate a substance (fibrin) from which these elements have originated.

But granting this view, to which we have become so wedded, to be no longer tenable—and if Virchow substantiates his statements, it no longer is—then we need not presuppose the existence of fibrin because we see nuclear growths or cells, now termed pus or exudation-corpuscles, which, according to some, are the elements by which the exuded fibrin is destroyed.

Is there not another view which may satisfactorily explain the nature of at least some of the formations which are found upon mucous membrane?

Are they not frequently simple products of perverted cell-growth, which, owing to a poison to be eliminated, or from some other unknown cause, gives rise to rapid multiplication of aborted epithelial cells, these being formed into membrane of a low vitality which soon disintegrates into granules.

Nor is it by any means an unsupposable case that cells which are arranged in rows, should leave some such appearance in the granules, the product of their disintegration.

These views have been confirmed by the examination of the deposit in the chicken already reported.

Another reason which might be adduced in their support is that mucous membranes are not disposed to transude fibrin. Mucous inflammation tends to the catarrhal form, and results in the formation of a tenacious albuminoid product, which is considered by modern pathologists, not as a *transudation*, but as a *product* of cell-formation. This excessive cell-action causes a rapid cell-growth and terminates in a degradation of the individual cell from exhaustion.

Note from Dr. G. B. WOOD *in relation to the Calabar Poison Vine, and on the Mode of Gathering the Resin of the Indian Hemp.*—Dr. CARSON stated that he had received a letter from Prof. G. B. WOOD, the President of the College, transmitting some of the seeds or fruit of the Assafœtida plant, which had been presented in Edinburgh to Dr. Wood by Drs. Christison and Balfour, the latter of whom is Professor of Botany in the University of Edinburgh, and Superintendent of the Royal Botanical Garden of that city.

Dr. Wood mentions having seen in this garden, during a visit in company with Drs. Christison and Balfour, among other novelties, an undoubtedly *genuine gamboge plant*, which had been brought or sent to Dr. Christison from Siam, its native country. As no flower was received, however, and as many years must elapse before the young plant they have will produce one, its precise botanical character has not been determined.

By permission of Dr. Wood, the following extracts from his letter were read by Dr. Carson to the College:—

"Some time since Dr. Christison received some of the seeds of the famous Calabar poison vine, used by the natives of that part of Africa in their trials for witchcraft; and, having taken about half of one of these seeds, he was so violently affected that his friends were alarmed for his safety. Some of these seeds were planted and produced a climber, which flowered in due time and enabled Dr. Balfour to determine its character. He named it *Physostigma venenosum*."

"Another point of some interest is relative to the mode of gathering the resin of the Indian Hemp by the natives. Dr. Christison says that he has learned directly from good authority in Hindostan, that this method consists in rubbing the leaves and flowering tops between the hands, and then, when these are sufficiently loaded with the adhesive exudation, to scrape it off. The prevalent notion that the natives gather the resin by walking through the fields of hemp, and afterwards scraping off the matter which adheres to their clothing, is, to say the least, apocryphal; nay, he considers it absurd, as the parts of the plant which exude the resin are above the heads of the natives, and the plants grow so closely together and are so strong that a native could hardly make his way through a field of them. He says, moreover, that, according to information he has received, the hemp plant does not produce the resin satisfactorily in the low hot plains of Hindostan, but in the regions near or among the hills. I have little doubt, myself, that it might be advantageously collected from the hemp of our own country; as specimens grown in my garden have had strongly the characteristic odour, and the tops have been very adhesive to the hand; which was not the case with a specimen I saw growing in the Botanical garden here."

Fatal Parturition from Inertia of the Uterus; Fœtus not delivered.—Dr. Corse read the following note of this case, and exhibited the fœtus and its membranes with the uterus: Mrs. A. P. was taken in labour at a period which she supposed to be the close of the eighth month of pregnancy.

The uneasy feelings usually preceding labour began gradually, and continued for several days without any increase of the pain or uterine contractions. She at length began to feel spells of sinking and prostration, which were at first slight and of short duration, but gradually became more marked and of longer continuance; their recurrence also became more frequent. No hemorrhage whatever took place, not even the usual amount which sometimes constitutes the *show* of obstetricians. I was sent for in consultation; but a few minutes before I arrived, one of her sinking spells came on, in which she expired.

Her colour at that time was exceedingly pallid. No patches or spots of purple or deep red appeared, as in cases of purpura and some other diseases, incident to a low state of the system. The body was plump, and the skin free from the shrunken and wrinkled state which it presents sometimes in cases of death from extreme prostration or exhaustion. She had had no diarrhœa or other exhausting discharge. A moderate quantity of food had been taken daily, and she had had a tolerable amount of sleep in short naps, but no long or refreshing sleep at any one time for several days.

The emotional system being depressed, for some weeks before her death she had been labouring under dejection of spirits. No good reason could be given to account for this, and we are left to suppose it to have been, for the most part, due to the remembrance of a former labour about two years before, from which she narrowly escaped with her life. In that labour she had had a placenta prævia, and was reduced by the hemorrhage to the last extremity, and lay many hours after delivery before reaction could be brought about. I was with her on that occasion, in consultation, and delivered the infant by version from a vertex presentation to a footling. Soon afterward some of her lady acquaintances very indiscreetly predicted that, if she should ever become pregnant again, she would surely perish in the delivery. It is not positively known that this preyed upon her mind, but she was meditative in her character and of taciturn habits. No other cause for depression of spirits is known to have existed.

Permission for a *post-mortem* 'examination was obtained, in hopes of finding some other cause of death, but our expectations were disappointed. I opened the body by incision near the median line of the abdomen, as is sometimes done in the Cæsarean section, and on cutting into the uterus found an anterior implantation of the placenta. The fœtus was in the second position vertex presentation and of large size, yet no obstacle to the delivery presented itself. No appearance of the fœtus induced the supposition that it had been long dead. The viscera of the thorax and abdomen were in turn examined, and all of them found in a healthy state, with the exception of congestion or engorgement which prevailed in all the internal organs except the uterus; this did not appear to have had more than the usual supply of blood. We are led to suppose that the depressing emotions have acted in this case on the general nervous system in such manner as to bring about inertia of the uterus. Such depression, however, is not necessarily the cause; since inertia of the uterus may occur in patients whose bodily strength is good. In other instances, also, where great prostration of the general system exists, the tone of the uterus is maintained and it acts vigorously. Admitting the inertia of the organ, from whatever cause, the presence of the fœtus is naturally exhausting; and *any* depressing cause, acting coincidently, would tell with twofold effect upon the vital powers. Should, under these circumstances, a syncope occur, the presence of the fœtus would be greatly against a successful reactionary effort.

The os uteri remained undilated, and was only about three-quarters of an inch in diameter; delivery, therefore, was out of the question.

Besides its pathological value, the *post-mortem* specimen here presented has a physiological worth. In it we may see the mode and extent of the attachment of the placenta to the uterus; the great size of the uterine arteries during pregnancy; the calibre and situation of the uterine veins, now called uterine sinuses; their greater capacity opposite the placenta, etc. etc.

Inspection of the ovaries would lead us to regard the left one as that which furnished the ovule for this pregnancy, there being in it a well-marked corpus luteum.

March 3. Fatty Degeneration of the Placenta, resulting in Abortion. Fœtus retained Two Months after its Death.—Dr. CORSE read the following sketch of the case, and exhibited the specimen:—

Mrs. H., pregnant for the third time, sent for me, on account of excessive menstruation, as she supposed. She stated that she had taken cold some time since, and, in consequence of it, had passed her last three menstrual periods without any discharge. About two weeks ago they had come on again, and still continued.

With the discharge she had only very little pain, but great weakness. Examination of the mamma showed the areola and papillæ indicating pregnancy; a per vaginam examination revealed an enlarged uterus; and some other signs, with these, induced me to express the opinion that she was pregnant about three months. She was reluctant to suppose herself in this condition, and said that her feelings were different from what they had ever been before. Under appropriate treatment the hemorrhage abated, but did not cease entirely. Several interviews followed, and examination showed the areolæ and papillæ increasing and the uterus enlarging, up to the end of the fourth month; at this time I noticed that the mammæ suddenly became smaller, and the areolæ faded considerably away; the uterus diminished in size, and the feel of it entirely changed. The hemorrhagic discharge had changed to a bloody serum which oozed away in no great quantity, but still enough to annoy the patient. These symptoms went on a little more than two months longer, and then she was taken suddenly in the night with profuse hemorrhage from the uterus. Pains soon came on, and in the course of a few hours she was delivered of the fœtus and membranes which I here exhibit. The placenta presents, all over its uterine aspect, a surface free from the tufted and villous character of the healthy organ; it is dense, of a suety hardness, and has very little elasticity. The thickness of the hardened portion is from two to three lines—the part of the organ between this and the fœtal surface being composed of the usual fibrous tissue, with interlacing bloodvessels.

Microscopic examination showed this structure to be fibroid, with much intervening granular, fatty matter; with difficulty could anything like villi be made out. Numerous granular corpuscles were visible, and some few nucleated organic cells were to be seen.

The attention of the profession was first called to this form of disease about seven or eight years ago. Since then the subject has been more closely investigated, and many pathologists are of opinion that the fatty state is secondary, the primary one having been some form of disease (probably inflammatory), accompanied with a copious exudation of fibrin. It is well known that these products of such low organization are very prone to run into a state of degeneration, with much oily matter, in a granular state, throughout.

Recent observations have shown masses of fatty degeneration to be very common in the placenta at the close of utero-gestation; and this has led to the supposition that this state is one of the phases of retrograde change normal to tissues whose period of existence has expired. This idea, however, cannot apply to cases of fatty degeneration of the placenta occurring in the earlier months of pregnancy.

Pus is said to be fatty degeneration of the exudation-corpuscles; and this might, without impropriety, be regarded as a state of degradation just short of pus; one of the stages in the process of cure where the vitality was not high enough to remove the fibrinous deposit by absorption, and not low enough to run into pus.

It would seem to me probable that this state was brought about by implantation of the placenta over a part of the uterine mucous membrane, which was in a state of inflammation; the endo-metritis would incline to set up the same action on the adjacent part of the placenta, and thus cause the deposit of fibrin. An effort towards cure on the part of nature converts it into fatty degeneration; but before the purpose is accomplished, the death of the fœtus takes place; and, after a greater or less period of time, this is expelled.

Case of Cold-stroke.—DR. HENRY HARTSHORNE gave a brief account of a case of fatal illness following sudden exposure to cold for a short time.

J. S. H., aged 14, previously in ordinary health. On the night of the 7th of February (on which day the thermometer had gone down nearly 50° Fahr. in twelve hours, with the rise of a piercing wind), he rose from his bed in the back chamber of a large house, and went, barefoot and in his night-shirt, to the window of the adjoining front room, which he opened and stood by for a few minutes, looking out, on account of an alarm of fire. Being thus thoroughly and suddenly chilled, he had some symptoms of indisposition the following morning, but became more ill as the day advanced. Dr. H. H. saw him about 5 P. M.; at which time he was suffering with headache, drowsiness, and vomiting; the skin moderately hot; the pulse hard and accelerated. A saline laxative had produced two evacuations of the bowels. Fourteen leeches were directed to be applied to the back of his neck, cold cloths were placed upon the forehead, and the solution of citrate of potassa was prescribed.

The next morning he was still suffering with severe headache; although his skin was of a lower temperature, and the hardness of the pulse had subsided; its rate being 95 per minute. In the afternoon he vomited twice; his bowels were also freely moved. The cold applications and neutral mixture were continued, and mineral water was allowed as a drink; a mustard plaster, also, being applied to the back of his neck.

About 6½ P. M., he became extremely restless and incoherently delirious, setting his teeth firmly against food or medicine, but opening them to receive and chew lumps of ice. He recognized no one except his mother. There was no clonic convulsion, but a disposition to clasp the fingers tightly against the palm, and to throw out the hands and feet with impatient suddenness. The skin at this time was *moist;* the pulse variable in force, but constantly accelerated.

Under the advice, in consultation, of Dr. Charles Evans, a blister was applied to the nucha at 10 P. M. It was found impossible to compel him to swallow any medicine. At about 4 o'clock of the succeeding morning he died. A *post-mortem* examination could not be obtained.

After careful inquiry, it was impossible to discover any probable cause for this sudden and rapid illness except his exposure, upon leaving a warm bed, to the piercing wind of a cold winter's night.

Such results of cold are undoubtedly rare; but similar cases have been recorded. A London periodical, quoted in the March No. of the *N. Am. Med.-Chirurg. Review*, mentions the case of a gentleman who, on a very cold day during the past season, was observed by a friend in the street to look ill; he was sent home in a cab, became delirious, and died in twenty-four hours. The number of sudden deaths in London, during the same cold spell, is believed to have been greater than at any previous period; while the aggregate general mortality was also excessive.

Larrey, in his memoirs, speaks emphatically of the importance of sudden and great *changes* of temperature in producing deleterious effects. He asserts that gangrene from congelation never occurs unless the body or limbs have been, after freezing, rapidly brought to a high temperature. The reverse of this was illustrated in the case above narrated: or, perhaps, we might more correctly say, that it was the converse or opposite of sunstroke or heat-stroke. Probably the rapid and extreme change of temperature disorganized the minute elements of important structures, especially of the brain; in a mode analogous to that in which congelation, especially when suddenly succeeded by the thawing process, destroys the vitality of plants.

A New Elastic Pessary.—Dr. H. HARTSHORNE also exhibited to the college several *ring pessaries*, of different sizes, made of vulcanized caoutchouc. The material and form were almost precisely those of the ordinary gum-ring given to infants. Dr. H. H. had first made use of the gum-ring as a pessary, and found the only objection to it to be its deficient size. The pessaries exhibited had, therefore, been made to order, at his request, through the agency of Mr. Hubbell (1410 Chestnut St.), by the Goodyear Rubber Company. In the cases in which he had so far used them, he had found them to answer perfectly well. After remaining *in situ* for many weeks, they had been found to show less evidence of change than many of the gutta-percha rings would have done.

The advantage of this kind of supporter is, in a word, its elasticity; which imitates and substitutes (or affords a supplement to) the natural supporting powers of the utero-vaginal apparatus, more benignantly than any inflexible or unyielding material can do. At the same time it is not unreliable, as is the case with the India-rubber air-bag or colpeurynter, and is free from the annoyance of a protruding tube.

Although medical men differ very much in their estimation of the value of pessaries in the treatment of uterine displacements, it would seem that the most obvious objections to their use must be removed or weakened, if we have at hand instruments which closely imitate the natural ligamentous tissues, in affording an elastic support. The same yielding or flexible character, moreover, makes it easier for the patient to introduce and remove the pessary for herself; an advantage, in many cases, of no slight importance.

June 5. Perineal Fistula, with Abscess of the Testicle.—Dr. CORSE read the following note of a fatal case, and exhibited the *post-mortem* specimen:—

Mr. H., æt. 44, sent for me, in consequence of daily chills, fever, and great prostration. I found he had a fistula in perineo, from which the urine constantly dribbled; none passed by the urethra. From him I learned that he had always had a weakness in the bladder from boyhood, and that his mother died early from phthisis. About the age of six years he received a hurt on the left hip-joint; this was followed by inflammation, which became chronic, ran into hip-joint disease, and finally resulted in anchylosis of the oint. He had suffered frequently from disorder of the urinary organs, with great pain and difficulty in passing urine. In the summer of 1859 the istula opened, and he passed water both by the urethra and by the fistula. n July, 1860, he underwent an operation for the cure of the fistula. This hope was not realized, but, on the contrary, he found himself worse rather han better. In this unhappy state he removed to Philadelphia in the utumn of 1860, and placed himself under my care. Of the operator or of the operation performed I have no knowledge, and his condition was not such as to justify me in undertaking any operative treatment. I therefore applied myself to improving his general health by means of tonics, nutritious diet, and stimuli. He rallied and regained, in some degree, his strength; soon, however, an attack of epididymitis set in, and ran into suppuration in spite of all efforts to prevent it. Great prostration followed this, and no course of tonics and nutritious diet seemed to bring him up; the abscess in the testis continued to discharge pus by a fistulous opening which had formed through the dartos. Not long afterward several carbunculous boils formed in different parts; he began to run down in spite of the very best diet, tonics, and stimuli, and at last expired.

A *post-mortem* was allowed, by which I obtained the specimen I here lay before the College. The first incision was made by placing the point of the scalpel about the middle of Poupart's ligament on the right side, and carrying it in a semilunar direction through the hypogastrium to the middle of Poupart's ligament on the opposite side; another incision was then made in the median line of the abdomen from the ensiform cartilage, to join the one already made. These incisions were deepened and extended through the peritoneum, so as to open the cavity of the abdomen; then the cuts on each side were carried downwards through the soft parts into the anus, thus inclosing the whole of the region involved exteriorly. The soft parts within the pelvis were then separated from the sides, and the rami of the pubis divided by means of a saw, the section passing through the obturator foramen near its middle. The piece now being loose, the remaining soft parts were divided down to the bottom of the pelvis, and the entire mass removed, containing the whole of the genital organs.

On examination it will be found that the bladder is reduced in capacity to about one inch in diameter; the walls are thickened and indurated, and have lost their elasticity. The whole mucous surface is covered with granulations; no part of the normal mucous covering being left. The fistulous canal is large, and occupies the place of the membranous portion of the urethra, which is almost gone by ulceration. The point at which the unnatural opening in the urethra has taken place seems to have been behind the triangular ligament; the liquid has followed that structure to its lower edge, and, passing under it, has made its way out about the centre of the perineum.

The abscess which has formed in the left testicle does not connect with the primary fistula, but it seems to have been caused by extension of the inflammation from the urethra through the vas deferens; for the one on that side is much the larger and yielded pus under pressure, while the smaller one on the opposite side yielded, on compression, a white milky fluid.

The ureters here are both very large, and yielded pus on pressure. Their mode of entrance into the bladder has lost its characteristic valvular arrangement; they enter directly through the walls, and present on the inside a large and ragged orifice.

The prostate gland seems to have been the seat of some inflammatory action, as several cavities are here to be seen, which contained pus.

The seminal vesicle of the left side is much thickened in its walls; the cavity remains open. The vesicle of the right side is one indurated mass, the cavity entirely obliterated.

The urethra has been cut open throughout its whole length, and the point of constriction shows that the unnatural opening does not necessarily take place close to the constricted part, the distance between them being, in this instance, more than three and a half inches.

Art. X.—*Summary of the Proceedings of the Pathological Society of Philadelphia.*

1860. *Feb. 13. Pseudencephalous Fœtus.*—Dr. H. Lenox Hodge exhibited a monster of this variety, the offspring of a patient under the charge of Dr. S. R. Morris. The body and limbs were remarkably well developed. The mother had previously given birth to a perfectly normal child; it could not be ascertained that any untoward circumstance had occurred to her during her pregnancy.

Respiration and circulation were established in this child, and continued for twenty-four hours; reflex action was readily excited. The tongue was constantly protruded, as if in attempts at sucking. About twelve hours after birth, the child had a convulsion, apparently brought on by its attempting to cry. A second convulsion occurred about twelve hours later, and was followed almost immediately by death.

Upon careful dissection, the state of the head was found to be as follows:—

The occipital bone is about half its natural size, its upper angle being doubled down so as to form a rounded edge just above the attachment of the tentorium. The occipital foramen is complete at the posterior border, and just above it there is a sharp projecting spine. The bone rises almost vertically behind this foramen, while in front the basilar process ascends nearly as abruptly, and is devoid of the usual groove for the medulla oblongata.

The temporal bones present their petrous portions running forwards as usual, but inclining very much upwards. Their squamous portions are but little developed.

The parietal bones are present, but doubled down like the occipital, and very slightly developed.

The sphenoid is almost entire, but the greater wings are wanting at their outer portions, where they should form part of the cranial wall. The optic foramina are very small, and the upper surface of the body of the bone continues the nearly vertical direction of the basilar process of the occipital.

All the other cranial bones are wanting.

The lower portion of the malar is present on either side.

The upper maxillary bones are partially developed; the left is larger and projects more forward than the right. In front, as they approach each other, they are rounded off below, leaving a gap between them. In a fibrous capsule at the anterior and upper part of each, there are two incisor teeth. The nasal tuberosities are wholly absent.

The lower maxillary bone is well developed.

From the above description it will be perceived that there was in this case a virtual absence of the cranium. A tentorium existed, closely connected to the bone below by fibrous tissue; above this there was no solid material to indicate the brain. About opposite the lower border of the axis, the spinal marrow was present, surrounded by pia mater; it was very soft, perhaps owing to the length of time the specimen had been kept. It is certainly wonderful that this child should have breathed for twenty-four hours.

Dr. DARRACH presented a tumour removed by Dr. Pancoast from the velum pendulum palati of a young woman æt. 20, at the clinic of the Jefferson College.

The growth was of the size of a hen's egg, and extended below the dorsum of the tongue on the side of the pharynx. It was of some years' growth, and constantly impeded deglutition, causing also at times a good deal of difficulty in respiration. The patient was endowed with a good constitution, and the tumour, which fluctuated slightly to the touch, was thought to be cystic in its character; its removal was therefore decided on. It was drawn forward by means of a large tenaculum, and the mucous membrane over it divided perpendicularly with the knife. The cyst thus exposed was white-coloured, thick, and resisting. After puncturing it freely so as to discharge a portion of the fluid it contained, the sac itself was easily detached from the surrounding parts with the end of the finger, and removed in a mass. No bleeding of any consequence followed, and the patient recovered very speedily.

Dr. Darrach examined the growth, with the following results: It consisted of a sac, composed of fibrous tissue, which contained a substance varying in consistence and colour from that of semi-hardened glue to that of a diffluent jelly. Portions also appeared to be undergoing degeneration. By everting the sac the contents were extruded, as in peeling a banana. Its form was an elongated oval, its size about that of a hen's egg. Upon more careful examination of the firmer parts of the tumour there could be seen delicate opaque white nerve-like bodies, separable from the rest of the mass by a little care. The softer portions adhered to the finger and could be drawn out like mucus or pus treated with an alkali. Acetic acid rendered them opaque and firmer. Boiling in water had no effect.

Microscopical examination.—From the varied and peculiar characters of the elements, this was very interesting. There were present—

1st. Cells of various forms.

2d. Peculiarly arranged fibrils (or mucin filaments?).

3d. Fibres having the appearance of fine elastic tissue.

These several elements would sometimes be mingled in one field of the microscope, but were more commonly found grouped separately, as if the tumour presented different degrees of development in different parts.

The cells were oval, round, caudate, bi- and tripolar, with one or two nuclei and bright nucleoli. Others had peculiar hernial dilatations, as if budding. Others again were apparently being changed into the forms resembling elastic tissue, already mentioned. None of the elements were affected by acetic acid except the cells, which were perhaps very slightly paled. This, however, may have been an optical effect from the action of the acetic acid upon the thin layer of mucin surrounding them.

The term enchondroma was first applied to tumours of this kind by Müller, and has reference to their resemblance to cartilage. They are when characteristic, firm, and sometimes hard and elastic. This latter quality has caused them to be mistaken for cysts, and under this impression they have been punctured. Their form approaches the oval.

The usual seats of their growth are in, upon, or near bones, most frequently the metacarpal bones and phalanges of the fingers. Next in frequency we find them affecting the glands, and of these most generally the parotid. They have been found in the testicle, mammary gland, and lung, and very rarely in the subcutaneous connective tissue. The one before us was, however, removed, as before mentioned, from the submucous tissue. This, perhaps, is its rarest locality; we have not as yet seen mention of them here.

Mr. Paget, in his admirable work on Surgical Pathology, page 432, describes a tumour with some few exceptions identical with the above. The one that he describes was removed from beneath the skin, near to the clavicle; there appeared to be no true cells, but nuclei among its elements.

A question of interest connected with this tumour is, whether its soft condition was a degeneration of a firmer tumour or a "defect" in growth. That it was the latter I am disposed to infer from the perfect condition of the cells and their abundance, as well as from the peculiar development of many of them.

It has been remarked by an eminent physician that much physiology might be learned by studying the pathological condition of the system. And we might add that much knowledge of the normal structures of the body may be obtained by the study of the abnormal. The pathological growths may present conditions allied to those found in the embryonic state, at which stage most light has frequently been thrown upon their development.

The close study of such tumours as the one before us would, no doubt, add to our knowledge of the development and connection between cartilage, white fibrous, and elastic tissue. I was struck, in the examination of this growth, with the peculiar fibrillation which radiated from a centre, the delicate fibres crossing each other in various directions. These were not connected with cell growth, but appeared as if produced by a species of crystallization from an amorphous blastema (mucin?).

Another striking element in this tumour was the peculiar elastic-like fibres and the cells apparently developing into these fibres, as seen in the figure. The question which arose was, whether the first-mentioned process was allied to the fibrillation of healthy cartilage from the hyaline structure, a beautiful instance of which is pictured in Prof. Leidy's work on Anatomy, page 176, and how far this might support Virchow's views as to the formation of the white fibrous tissue by a direct fibrillation of the blastema. Also, how far there was a connection between the cells of this tumour, which appeared to be elongating into elastic-like fibres, and the above author's ideas of its formation.

Feb. 27. *Anencephalous Monster, with Spina Bifida, and Failure of Development of the Anterior Abdominal Walls.* Dr. PACKARD exhibited this specimen, given to him without history, about eight years since.

It is a female child, born apparently at about eight months of utero-gestation. A membranous sac exists in connection with the head, forming the upper wall of the cranial cavity. No trace of brain matter can be detected, although the nerves may be seen passing through foramina in the base of the skull, in the eminences of which may be dimly traced the anterior and posterior clinoid processes, and the petrous portions of the temporal bones. There seems to be no frontal bone, except a thin border far back on the upper surface of the eyeballs. The rest of the vault of the cranium is reduced to a mere rim.

Another sac exists in connection with the cervical and dorsal portions of the spinal column; the pedicles of the vertebral arches are directed outwards, and the cord is represented by a bundle of fibres on either side, resting on the posterior surfaces of those processes.

The anterior wall of the abdomen was developed into a thin membranous sac, containing the heart and pericardium, and all the abdominal viscera.

Calcareous Degeneration of the Ovary.—Dr. HODGE exhibited a specimen of this lesion, with the following remarks:—

This specimen was presented to my father by Dr. Thornton, of Mississippi. It was removed from a negro woman, who died in her forty-fifth year. At the age of seventeen, she gave birth to a child, but never afterwards menstruated. She grew quite fat, and suffered no inconvenience from the tumour. The specimen is of an ovoid shape, measuring six inches and a half in its longitudinal diameter, and four inches transversely. It weighs one pound and twelve ounces. The surface is nodulated, very rough, and covered by a fibrous layer, which follows closely all its irregularities. The mass has been sawn open, and exhibits interiorly narrow, fibrous bands, running throughout the mass. The calcareous deposits in the interstices may possibly be the result of a degeneration of the Graafian vesicles.

Cancer(?) of Œsophagus.—Dr. KANE related the circumstances of an autopsy made by him, with the assistance of Drs. Mitchell and Packard, at St. Joseph's Hospital on the 24th February. The subject was an Irishman, æt. about 55, of large frame, admitted to the hospital a few days before his death; ascites, hæmatemesis, melæna, and exhaustion were his chief symptoms.

Belly largely distended, and fluctuating; about three gallons of yellow serum in the peritoneal cavity. Lower extremities œdematous. The *lungs* were healthy, with some *post-mortem* congestion. Adhesions of the pleura were observed posteriorly, especially on the left side; and bands of lymph connected the two layers of the left pleura at one portion opposite the middle of the pericardium. About a pint of serum was noticed in each pleural cavity. The pericardium was thickened by a deposit of fat. The *heart* was rather large and flabby; it had a good deal of fat upon its outer surface, but contained no clots; the tricuspid valve was healthy, one flap very slightly thickened; the pulmonary valves deep red, but not otherwise changed. The mitral valve was much thickened and stiffened; one of the chordæ tendineæ attached to it was thickened into a firm white mass. The aortic semilunar valves much thickened, and stiff from atheromatous deposit. The veins on the outside of the heart were quite tortuous, and felt firm under the finger. In the right ventricle a portion of the endocardium was reddened, as if by inflammation; in the left there were several patches of extravasation, one particularly marked upon a papillary muscle. The aorta presented a marked redness of its lining membrane, in some portions much deeper than in others.

The *liver* was much contracted, and in a state of complete cirrhosis. The *vena cava ascendens* was slightly bridged over by hepatic substance, and narrowed from its point of entrance below to its exit above, its cylinder being maintained by the firmness of the surrounding tissue. The vena portæ was of about the usual size and appearance, but its branches within the liver were diminished in calibre. The gall-bladder was full of yellow and extremely viscid bile, and its substance was very pale.

Pancreas large and quite firm, but nothing abnormal in its appearance on section. The capsule of the spleen was quite thick, and of a greenish or bluish-white colour; but the substance of the organ seemed absolutely healthy.

Kidneys and supra-renal capsules quite normal.

Near the lower end of the *œsophagus* was a long and wide irregular ulcer with frayed edges. Several veins were close to the surface of this ulcer, and one of them presented an open orifice, whence probably the fatal hemorrhage had occurred. The mucous glands of the tube were elsewhere much swollen.

Within the *stomach* there were f℥iv or so of soft blood-clots; the mucous membrane was mammillated, and along the rugæ were streaks of injection; but there was no ulceration at any point. The rest of the alimentary canal was in no respect abnormal, except in containing a grumous, bloody liquid, in not very large quantity. Blood throughout the body much less than normal, almost entirely free from clots. Much fat was present in the abdominal parietes, as well as in connection with the peritoneum covering the different viscera; the great omentum was very thick from fatty deposit.

Hypertrophy of the Pyloric Extremity of the Stomach.—Dr. Moss presented this specimen, with the following account:—

The subject of this lesion was a female æt. 52, a native of Alsace. The history of the case is very meagre, as Dr. Thompson, at whose request I made the autopsy, first saw her a week before her death. She had been ailing for several years, and had kept her bed for six months. She was excessively emaciated, and suffered from piercing pain in the epigastrium and from vomiting, soon but not immediately after eating. Very little if any blood appeared in the vomited matters. A hard nodulated tumour of considerable size was detected in the epigastrium; its position was not constant, changing into the left hypochondriac and umbilical regions. Three days before death the patient sank into a stupor, passing her urine and feces involuntarily. Several members of her family had died of phthisis; none had suffered from cancer.

Autopsy, thirty-six hours after death.—Cranium not opened.

Thorax, pleuræ, heart, and pericardium healthy, the latter containing about a wineglassful of fluid. The lungs were healthy, except at their apices, which were sparsely studded with hard cretaceous tubercles; over the left apex there was an old pleuritic adhesion.

Abdomen.—The position, size, and structure of the liver were unaltered. The stomach lay under the intestines across the spine; it was markedly enlarged, chiefly in its long axis, and its pyloric extremity was occupied by a hard tumour the size of the fist. A few glands in the vicinity were enlarged, and at its point of contact with the under surface of the liver that organ was rather more than commonly friable. The intestines and other abdominal organs were healthy. The stomach contained a small quantity of thin, dark-coloured fluid and a few lumps of vegetable ingesta. Its mucous surface was of a dull dirty white colour, and, except at the pyloric end, none of its coats were hypertrophied. The tumour entirely surrounded the pyloric end of the stomach, commencing abruptly at the pylorus, extending about four inches towards the cardiac end, and gradually decreasing in thickness, but at its junction with the healthy stomach an abrupt line could be felt. Its mucous coat was of the same colour as that of the rest of the stomach and perfectly intact, except at the lower and cardiac end, where there was an ulcer the size of a quarter dollar, which had destroyed the mucous coat and laid bare numerous transverse fibres in the tissue beneath; the surface of the ulcer was clean and hard, and so pale that it almost escaped detection. The tumour was hard and knobby, and very tough under the scalpel when cut into. It presented to the eye two distinct layers; the outer one was translucent, of a yellow gelatinous colour, and firm to the touch, being evidently the muscular coat very much hypertrophied; in some places it was one-fourth of an inch thick. The inner layer, which was from one-half to three-fourths of an inch thick, was white, opaque, very tough, and sent off numerous fibres perpendicularly with the muscular coat.

Under the microscope.—The white abnormal structure proved to be composed of dense fibrous tissue at various stages of development, white and yellow fibrous tissue, fusiform cells, and roundish cells, the whole covered with fatty molecules. The outer translucent substance, in addition to these elements, was made up of unstriped muscular fibre. I was unable to discern any traces of cancerous structure or arrangement, either in the tumour or in a section taken from one of the neighbouring enlarged glands; I am therefore of opinion that this is a mere hypertrophy of the submucous areolar tissue and of the muscular coat, a lesion less frequently met with than cancer of the stomach, but probably frequently mistaken for it. The aspect of this tumour, the regularity of the arrangement of its elements, the want of fusion of its coats and of stenosis at the pylorus, tend to confirm this diagnosis.

Varicocele of the Leg.—Dr. BRINTON exhibited a specimen of injected varicose veins of the leg, removed from —— ——, an Irishman, æt. 55, who was admitted into the St. Joseph's Hospital with a compound fracture of the middle third of the tibia and fibula, the result of an accident from a passenger railway car. The leg was amputated at the upper third by Dr. McClellan some six hours after the reception of the injury. The hemorrhage after the operation was very abundant, necessitating the application of some fifteen or sixteen ligatures. Many of these were placed upon venous trunks which were discovered to be enormously dilated; their walls were thickened, and when cut across did not contract, but remained patulous. The bleeding was controlled with great difficulty, but by the removal of the tourniquet and the application of the ligatures was finally arrested. The patient did tolerably well for more than a week, despite a considerable oozing of venous character. On the tenth night, however, copious arterial hemorrhage occurred from the stump. This, it was found, could only be arrested by the ligature of the femoral artery, which was accordingly effected beneath the sartorius muscle. The ligature thus applied separated at the expiration of two weeks, and the patient sank from hemorrhage from the wound.

The veins of the leg were injected with wax by Dr. Brinton, a pipe being inserted into the internal saphena vein. The injection filled not only the superficial veins, but also ran into the venæ comites of the anterior tibial artery, which was found to be in an equally dilated condition. The fact of dilatation of the deep muscular veins being oftentimes coincident with spontaneous varicosity of the superficial veins of the lower extremity, has been insisted upon by M. Verneuil in a paper read before the Academy of Medicine at Paris, and the same occurrence has been observed by Dr. S. W. Gross of this city in a specimen recently exhibited to this society.

Dr. Brinton drew the attention of the members to the peculiar formation of fibrous tissue which had developed itself upon the concave portion of every one of the arches formed by the convolutions of the diseased vein. This tissue was so dense and hard as almost to defy removal without injury to the walls of the vessel. The tenacity and firmness of this growth served apparently to limit the amount of the disease, and to restrain the natural tendency of the walls of the veins to yield at the summit of the convex arches.

A Remarkable Case of Congenital Aneurismal Varix of the Leg and Foot.—Dr. S. W. Gross read the following case:—

An unmarried female, forty-three years of age, from Washington County, Pennsylvania, was admitted into the Hospital of the Jefferson Medical College, on the 10th of November, 1858, on account of a remarkable aneurismal enlargement of the superficial veins of the left foot and leg, from the base of the toes as high up as the knee. Not only were the vessels very tortuous and greatly dilated, but they were the seat of pulsation, synchronous with the contraction of the left ventricle, and perceptible both to the touch and to the naked eye. The aneurismal thrill was well-marked, and auscultation revealed a *bruit de souffle*, of a whiffing nature, and most distinct over the posterior tibial region. These signs were not so evident when the limb was elevated, but when it was dependent, the veins became larger, and the thrill and pulsation were much increased. The internal saphenous vein, which was particularly affected, appeared to be about an inch in diameter at various portions of its course, and the circumference of the leg was greater by an inch and a half than that of the sound one. The great and second toes were webbed, and a deep, excavated ulcer, as large as a ten-cent piece, with a foul bottom and everted edges, was seated in the dorsal surface of the foot, just in front of the two inner metatarso-pharyngeal articulations. The foot had a spongy feel, as if distended with enlarged veins, and it measured two inches more over the instep than the opposite one. The toes were distorted, and the leg, which was slightly longer than the right, was at times the seat of great pain. The ulcer occasionally bled, and always healed when the limb was kept elevated and at rest, but as it was impossible to observe these precautions, it has remained open for a number of years.

The patient was born with a nævus maternus, which was situated on the back of the foot, between the instep and the toes, and at the age of three years the foot began to enlarge, the superficial veins and arteries became tortuous and increased in size, and the temperature of the member was elevated. Six years subsequently the ulcer made its appearance near the web of the great toe, and about four years previous to her admission into the hospital, sores broke out on different portions of the foot, the largest being seated over the internal malleolus. As these bled freely whenever she walked, it was necessary for her to keep at perfect rest for eighteen months. She had occasional palpitation of the heart, but there was no evidence of disease of that organ, nor was there ever any arterial disease in her family. Her general health was pretty good up to 1856, during which year she suffered from an attack of bilious remittent and of typhoid fever. Her hair was brown, her eyelashes long, and her complexion dark; but her face presented a sallow, doughy appearance. The pulse was seventy-two, and she felt and looked rather well. Seventeen years ago a physician took up two arteries on the inner and upper portion of the leg, and failed in an attempt to ligate the femoral in the lower part of its course.

As the leg was the seat of a great deal of pain, and the patient was obliged to use crutches, from inability to bear her weight on the foot, the limb was utterly useless, and a source of inconvenience. On this account it was determined, without resorting to other curative measures, to remove it. The amputation was accordingly performed by Professor Gross, below the knee, by the antero-posterior flap method, on the 13th of November. The internal saphenous vein emitted a good deal of blood, and as it behaved like an artery, not contracting when divided, and the orifice being at least three-fourths of an inch in diameter, it required the application of a ligature. At the expiration of sixteen days all the ligatures had come away, and the wound of the stump had nearly closed. The patient had taken a nutritious diet, with tonics and opiates from the very commencement of the treatment, but the stump discharged a considerable quantity of slightly offensive and badly elaborated pus. On the eighteenth day the integument of the popliteal region had an erysipelatous appearance, and distinct fluctuation being present, an opening was made, with the effect of giving issue to about six ounces of thin, unhealthy, fetid pus. The stump was painful and tender on handling, the pulse frequent and irritable, the countenance pale and anxious, and the patient was much depressed in spirits, and very restless. About eighteen hours later chilly sensations set in, followed by increased heat of the surface, and profuse perspiration; the features became shrunken, the skin icterode, the body emaciated, and hectic fever with typhoid symptoms rapidly supervened. The discharge of pus became so profuse as to require the limb to be dressed morning and evening; it was excessively fetid and nauseating, and at each dressing at least a pint of matter was pressed out of the opening made in the ham. A large bedsore formed over the sacrum, and the patient lingered in a low, muttering delirium until the twenty-eighth day, when she died in a state of complete exhaustion.

The treatment adopted in this case consisted in the free administration of quinine, the tincture of the chloride of iron and ammonia, with a nourishing diet and an abundance of milk-punch. Opiates were given freely to relieve pain and procure sleep, and the stump was enveloped in warm dressings, and injected with the dilute chlorinates, which were also freely employed externally. Tincture of iodine was applied to the limb as far up as the pelvis, and the thigh was also supported by a roller, for the purpose of facilitating the escape of pus, and to prevent it extending higher up. The apartment was ventilated as thoroughly as possible three or four times in the twenty-four hours.

A *post-mortem* examination, made about sixteen hours after death, had to be limited to an inspection of the limb. On cutting into the thigh, it was found to be the seat of an immense diffuse abscess, extending from the stump to the crest of the ilium, and dissecting the softened muscles from each other. The popliteal artery and vein were bathed in a depot of pus, which was thin and offensive, of a grayish colour, and mixed with aplastic lymph. The internal saphenous and popliteal veins were plugged with clots about six inches in length, and contained sanious pus and broken down lymph; their lining membrane was inflamed, and their coats thickened.

The amputated limb was injected with a mixture of tallow and magnesia through the posterior tibial artery, and the material flowed not only into the superficial and deep veins and arteries, but escaped very abundantly from the medullary canals of the tibia and fibula. Upon inspecting the dried and prepared specimen, it will be found that all the superficial veins are varicose to a most striking extent, as are also the deep veins, but in a lesser degree. At many points the internal saphenous vein is dilated to the extent of three-fourths of an inch in diameter, its course is tortuous, and its coats are greatly thickened. The veins emptying into it are much enlarged and twisted, and they form an intricate plexus over the dorsum of the foot, and the anterior and internal aspects of the leg. The dissection of the specimen was somewhat difficult from interstitial deposits of lymph, and it was impossible to bring into view the enlarged veins and arteries on the plantar surface of the foot, which formed a most intricate network, or rather a confused mass of injecting material. The external saphenous vein is slightly enlarged, and is accompanied by several smaller varicose vessels. The posterior tibial artery is nearly as large as the femoral, and its accompanying veins are twisted and nodulated.

Remarks.—Aneurismal varix is most frequently observed at the bend of the elbow, as the result of badly performed venesection ; but it may also be of spontaneous origin, on account of ulcerative action taking place between a contiguous artery and vein. In either event the arterial blood entering the vein communicates to it a pulsatile movement, synchronous with the contraction of the left ventricle, and the consequence is that the resistance of the walls of the veins being weakened, it becomes dilated, as in the case of ordinary varix. In the instance, however, before us—and I can find none of a precisely similar nature on record—the great point of interest is that the aneurismal varix is not due to either of the above-mentioned causes ; but its origin can be traced to a congenital nævus maternus seated on the dorsum of the left foot below the instep. In the first place, then, there was a small spot, consisting of slightly enlarged capillary arteries and veins, which finally became enormously hypertrophied and dilated. The tumour may be said to be situated on the back and sole of the foot where the capillary enlargement is best marked, and the arteries and veins at some distance beyond its limits greatly increased in size and tortuous. From the fact that the posterior tibial artery is in a state of cirsoid dilatation, it is probable that the great bulk of the swelling on the sole of the foot is due to the enlargement of the terminal capillaries of that trunk. Inasmuch as it was impossible to distinguish any artery, excepting the posterior tibial, on account of the free manner in which the injection ran, I have represented the enlarged vessels as veins, by giving them a blue colour. It is interesting to note that the symptoms of purulent infection came on within forty-eight hours after the detachment of the ligatures from the arteries of the stump and the internal saphenous vein ; and the general condition of the patient, as well as the unhealthy character of the pus discharged from the stump, pointed to the existence of a pyogenic or suppurative diathesis.

March 27. *Monstrosity.*—Dr. PACKARD exhibited a malformed fœtus, obtained by him at the University dissecting-room, whither it had been sent without history.

It would seem to have been born at full term, although of small size. Except the left foot, which presented a marked talipes varus, the extremities were perfect, as were also the bony portions of the trunk. The head was in all respects well formed.

Just below the point of entrance and exit of the umbilical vessels, the skin of the abdomen became continuous with the outer covering of a finger-like protrusion, about one and a half inch in length ; this outer covering had the valvulæ conniventes, and the vascular, villous appearance of the mucous coat of the jejunum, which, indeed, it proved to be. At the tip of the protrusion there was an orifice, the edges of which were formed by the inversion of the mucous and other coats of the tube, through which a probe could be readily passed into the upper part of the small intestine. Hence there may be said to have been an artificial anus at the umbilicus, with a prolapsus of the intestine.

Below the protrusion just mentioned, there was an irregular swelling, at the lower part of which an opening led into a tube one and a half inch long, the direction of which was downwards and backwards in a curve, but keeping the median line. This tube was lined, and the swelling at its upper end was covered, with smooth red mucous membrane; it terminated in a blind pouch, and evidently represented the lower portion of the colon, a fibrous cord continuous with it indicating an imperforate rectum.

At either side of this tube, firmly attached by areolar tissue to the brim of the pelvis, lay a somewhat irregularly bean-shaped body. Being laid open, each of these was seen to consist of a uterus, with a well-formed os tincæ, and a very short vagina; this latter had on the right side an external opening, while on the left it was closed, perhaps by mucus. Connected with the upper end of each of these bodies was a distinctly marked ovary and corpus fimbriatum; so that the abnormity here seemed to be merely a wide separation of the two symmetrical portions of the uterus, and not a duplicity of the organ.

No urinary bladder existed; but the ureters descended normally, and each one ran under the corresponding vagina, to terminate at its outer side. Thus the intervening cutaneous surface represented an exstrophied bladder. Just within each inguinal fold was a small prominence of skin, doubtless the indication of the labia majora; no other distinct trace of external organs existed.

Posteriorly, at the lower extremity of the back, the skin was elevated into a rounded swelling over a sac communicating with the dura mater, and containing f℥j or more of bloody serum. This sac seemed to be simply supplementary to the spinal canal; at its upper part, on its anterior surface, were two rounded vascular masses of a tufted appearance.

It was easy to perceive that there was a deficiency in the junction of the lateral halves of the pelvis anteriorly; and dissection showed that this was owing not to the absence of any part of the bony walls, but simply to a separation of the bodies of the pubic bones, the interval between them being filled up with areolar tissue and fat. It need hardly be suggested that this separation and that of the lateral halves of the uterus were intimately connected, and probably due to the same cause, whatever that may have been.

Spina Bifida, with Cyanosis.—Dr. Kane gave the following account of the case, exhibiting the parts:—

The subject from which these specimens were obtained was born under the auspices of a student in Dr. Penrose's obstetrical class, and the history of the case is unfortunately meagre and unsatisfactory. The mother, a delicate florid-complexioned woman of about twenty years of age, was, during the first six months of her pregnancy, under my care for disease of the heart, with mitral regurgitation, accompanied by severe pains in the back, and a constantly recurring menstrual flux; the latter symptom came on about eighteen months before, shortly after the birth of her first child, and continued at intervals of two weeks until within four months of her last confinement. About three weeks before this event she experienced severe pains, and had a slight discharge from the vagina; but the symptoms passed off. The labour was normal and easy.

The child, which was a male, cried freely on entering the world, and its functions were naturally performed. The region of the sacrum was unusually flat, and covered only by a thin transparent pellicle, through which the vessels and moving fluid could be plainly distinguished. The following morning this pellicle had developed into a fluctuating tumour; on this morning, also, it was observed that the child appeared to have an impediment in his breathing, and that he sucked with difficulty. The latter symptom continued to increase until the 15th of February, 1861, when death took place.

The tumour was at first pellucid, but it shortly assumed a dark purple colour. It slowly increased in size during thirteen days, when it burst and evacuated its entire contents, which consisted mainly of bloody serum with some pus. It scabbed over and gradually became distended again, but never entirely regained its former size.

I first saw the child on the afternoon of February 15th; it was then in a dying condition. It was lying perfectly still in its mother's lap with its eyes closed, breathing very slowly and apparently with great difficulty. Several seconds invariably elapsed between the inspirations, which were made with short spasmodic jerks, and were accompanied by a whooping sound and by a depression of the trachea. I could not detect any corresponding depression of the intercostal spaces or abdominal muscles, although the thorax appeared to expand but little. The entire surface of the body was of a dark crimson hue.

Percussion elicited a clear sound over the entire chest. My efforts at auscultation were unsatisfactory, owing to the jerking character of the respiration and the position of the child in its mother's lap, any attempt at altering which was attended by an entire cessation of respiration for from fifteen to twenty seconds, during which time the child would become so livid that I feared immediate death.

The fontanelles were large, and the separation of the cranial bones at the sutures rather wider than usual.

The sacral portion of the spine was the seat of a fluctuating, semitransparent, lobulated tumour about the size of a green-gage, constricted at the base, and of a dark purple colour; its tegumentary covering was very thin, and ulcerated over its most prominent portion. This tumour was evidently connected with the medullary canal; by pressing near its constricted margin I could readily feel the free margins of the imperfectly developed half arches of the sacral vertebræ. The rest of the spinal column appeared to be normally developed, all the spines being prominent. The left leg was partially paralyzed, and presented the somewhat rare deformity known as talipes calcaneus. The child remained in the condition I have described until noon of the following day, when it died. There was no convulsion preceding death.

Autopsy twenty-three hours after death.—The body was rather small, but not emaciated. There was marked rigor mortis.

The lungs floated on water, but were much congested, especially at their upper portions, the congestion being most marked at the apex of the left lung.

The heart was about the usual size and shape, and all its valves were normally developed, but the ductus arteriosus and the foramen ovale remained pervious. All the cavities of the organ were distended by soft dark clots.

The liver, kidneys, and intestines were normal.

The brain was not examined.

The fluctuating tumour over the sacral region of the spine had somewhat diminished in size, not being larger than a large prune-plum. On cutting through its outer walls, which were very thin and appeared to be composed of the integuments and dura mater, about two teaspoonfuls of bloody serum escaped, bringing to view an inner sac, much smaller, which protruded from the spinal canal through the deficient half-arches of the sacrum. This I took to be the true arachnoid sac; it was about an inch in length, and as large round as a large swan-quill. When first exposed, it was filled with a clear pellucid fluid, but gradually emptied itself. On laying it open, several filaments of nerves were seen losing themselves upon its inner surface. The sacral half-arches were entirely wanting, and those of the fifth sacral vertebra were only partially developed, the union between them being formed by a ligamentous band. The rest of the spine, however, was normally developed.

Members of the family who remained in the room objected to my proceeding further with my examination, so that I was unable either to examine the brain and upper cervical vertebræ, or to trace out the sacral nerves.

April 10. *Abscess in the Head of the Tibia.*—Dr. HODGE exhibited a diseased tibia, with the following remarks:—

C. D., a coloured woman, sixty-four years of age, was admitted to the Pennsylvania Hospital, May 3, 1859. She stated that for about forty years she had had more or less trouble with her left leg. At various times ulcers had formed upon it, but they had successively healed. During the winter of 1856–7, she had been in the hospital for these ulcers. Since then she had been moving about as usual, except during the last few months.

At the time of her admission, the whole leg was much swollen; there were two ulcers above the internal malleolus, and in front, just below the knee, a sinus leading to dead bone, with two fistulous orifices on the inner side of the knee. The pus discharged was in very great quantity, and of an offensive odour. Her system was very much weakened; she suffered a great deal of pain, and could obtain but little sleep.

After consultation with his colleagues, Dr. Neill amputated the limb just above the knee. Mortification of the flaps ensued, and in a few days the woman died.

The head of the tibia presents a circumscribed abscess measuring in its length two and a quarter inches, and in its width varying from three-quarters to one and a half inch. Its depth is about one inch, and its external orifice is about a quarter of an inch in diameter, and smoothly rounded. The bone around the abscess is hypertrophied and roughened. The periosteum was much thickened. The orifice of the abscess is in front, and about one and a half inch below the knee.

April 24. *Secondary Carcinoma.*—Dr. HODGE related the case, as follows:—

On the 9th of November, 1859, I presented to the society a specimen of cancer of the breast removed that morning by Dr. Norris. (See *Proceedings of Path. Soc.*, vol. i. pp. 268–270.) The wound made in its removal healed kindly. About eight weeks, however, after the operation, little nodules of characteristic hardness were detected a little way above the scar. They gradually increased in size, and the patient soon experienced a return of her old lancinating pains. Her appetite and strength began to fail, so that by May she could only walk a few squares. At that time she was liable to severe attacks of pain in the breast, and also experienced a constant sensation of soreness. The hardened nodules varied in size from that of a pin's head, just beneath the skin, to that of a hickory-nut, evidently involving the deeper seated tissues. In front towards the sternum, and behind towards the axilla, these nodules had ulcerated superficially. Under the simplest local applications (lime-water almost exclusively) these ulcers rapidly healed, the nodules gradually diminished and disappeared, leaving the surface perfectly even and the skin sound, though very vascular and delicate, till she died. In the meanwhile, the cervical glands of the same side (the left) became enlarged, then also those on the opposite side, and last fall I noticed that a gland of the right axilla became affected. Soon the right breast, which up to this time had been large and pendulous, began to contract and to harden. During the last month or so of her life, it was of a stony hardness, perfectly rigid, and about the size of half of an orange. It never caused her any pain, and but little inconvenience, excepting the nipple, which became very sensitive to the touch, apparently from the constriction at its base caused by the great condensation of the tissue of the breast. Little hardened nodules constantly appeared in the skin, especially on the lower and anterior portion of the thorax. At one time these caused her intense suffering for a day or two, but ceased to annoy her after the application of some glycerin. The greatest pain that she experienced, however, was seated in her left arm. Soon after the return of the cancer to the breast this arm began to swell, and continued enormously swollen until she died. Its weight caused her great inconvenience at all times, and the occurrence of lancinating pains throughout it were frequent.

Her general health gradually failed her, though she never seemed to despond. In December last she began to vomit nearly everything she ate, and was constantly oppressed with nausea. This, however, somewhat improved, and for a time she relished some few things. In February she was troubled by a severe cough, free expectoration, and great dyspnœa. These symptoms also improved, but left her much weaker, and with a sense of weight about the region of the heart, and difficulty in breathing. Throughout the chest there was great dulness on percussion and obscurity of the respiratory murmur. During her illness her bowels were very costive. Her catamenia returned regularly until January, when they ceased to appear. During the last few weeks of her life she was liable to "screaming spells," as her friends called them; she was always conscious that she had screamed, but never gave any reason for doing so. At times she would talk strangely, but still knew everything around her. She daily grew weaker, and on Sunday, April 21st, she quietly died.

Upon making the *post-mortem examination*, the *brain and its membranes* were found deeply congested, but exhibited no marks of cancerous degeneration. There was great effusion of serum into both *pleural cavities*, especially the left. The *left lung* was collapsed, adherent to the walls of the chest, and filled with cancerous deposits. The *right lung*, though in a much less degree, was similarly affected. The *pericardial cavity* was filled with serum, and its tissue, especially towards the left side, was studded with cancerous nodules. The *stomach* exhibited no evidence of cancer. The *liver* had three or four white cancerous deposits in it about the size, severally, of a half-dime. The *kidneys* exhibited a few cancerous particles. The *mesenteric glands and the ovaries* were perfectly filled with cancer. The *uterus* appeared to be unaffected. The *right breast* also was cancerous. The *skin*, and all the *soft tissues* of the thorax and abdomen were filled with the cancerous deposits so as to have lost their elasticity. We were unable to examine the left arm.

June 12. *Cancerous Tumour of Cerebrum.*—Dr. HODGE related the following case:—

In August, 1858, Miss H., about forty-eight years of age, noticed a small lump in her right breast. During the fall and winter, she says that the tumour continued to enlarge, and at times caused her severe lancinating pain. In April, 1859, she was admitted into the Pennsylvania Hospital. The tumour was quite prominent, the skin was of a purplish hue over the upper and posterior surface of the breast, and seemed on the point of giving way. After a careful examination, the surgeons of the House pronounced it cancerous in its nature, and advised its removal. The microscope afterwards corroborated their opinion. The patient's general health had suffered much during the winter, she had lost flesh, and, always of an excitable temperament, had now become excessively nervous.

On the 10th of April, 1859, Dr. Neill excised the tumour and the mammary gland. The wound readily healed, and the patient rapidly improved in health and strength. She became very fat and more robust than she had, perhaps, ever been before. Last January, however, her catamenia ceased to appear, and she experienced, at irregular intervals, flushes of heat in her head. This did not amount to much until April; she sent for me on the 12th, continued about the same until the 17th, when she became a little confused in her mind, and about mid-day had a clonic convulsion, beginning with her right arm, but extending to her whole body. A little indisposition to use her right arm followed this attack, but in ten days she seemed almost to have recovered herself. Then, however, her mind became somewhat dull, her memory often failed her, and her right arm became totally paralyzed; this was followed by a paralysis of her right leg. At times she would for a few days improve, but she gradually became more stupid, and died on the 4th of June.

Upon making the *post-mortem* examination we found no appearance of cancer about the breast, but a cancerous tumour in the cerebrum. It was situated in the left hemisphere at the anterior margin of the lateral ventricle. Its size was about that of an English walnut. The brain around it was softened, and all the tissues of the cerebrum and cerebellum were much congested. There was no effusion except into the left ventricle, which was distended with serum. Every other organ of the body was perfectly normal, except the uterus, which was studded, both within and without, with fibrous deposits of various sizes.

REVIEWS.

Art. XI.—*The Pathology and Treatment of Venereal Diseases; including the Results of Recent Investigations on the Subject.* By Freeman J. Bumstead, M. D., Lecturer on Venereal Diseases at the College of Physicians and Surgeons, New York; Surgeon to St. Luke's Hospital; Assistant Surgeon to the New York Eye Infirmary. Philadelphia: Blanchard and Lea, 1861. 8vo. pp. 686.

The perusal of this work has afforded us unfeigned satisfaction, and we conceive that we are simply fulfilling a duty in inviting to it the attention of the profession. The previous labours of the author afford evidence that he possesses an extensive and accurate acquaintance with the literature of venereal diseases, and that he has also had a large experience in their treatment, but something more than this is requisite for the preparation of a good work on these diseases. An extensive acquaintance with the literature of his subject often leads a writer to make practical details subordinate to theoretical discussions, and practical knowledge of the treatment of a disease is by no means inconsistent with a total inability to describe clearly the manner in which this treatment is to be successfully executed. Moreover, an advantageous arrangement of the various subjects, and a correct style, are equally essential, and are more frequently wanting, perhaps, in works on venereal affections, than in any others offered to the medical profession. The work before us, however, we find in every respect—in matter, in arrangement, and in style—all that could be desired.

A work, such as this, on venereal diseases, was greatly needed. The doctrines taught in the special treatises on the subject, and in works on general surgery are always incomplete, often contradictory, and very generally erroneous. The treatment practised by the profession at large is, as a matter of course, far from being judicious. Under the belief that mercury is absolutely necessary in the treatment of syphilis—acquainted with no means of diagnosing this disease—and believing it best to be on what is considered the safe side, medical men are often seen administering this powerful medicine for every running from the urethra, and for every sore spot upon the penis. We were lately advised by a practitioner of very considerable eminence, that John Hunter was the only writer on syphilis who ought to be followed, and that all venereal sores should be treated in accordance with his directions. A large number have not yet reached the epoch of Hunter, and give mercury not only in all forms of venereal ulcer, but also in every case of urethral discharge. And this is done in accordance with what is taught in books printed at the present day. At the same time, while no diseases are so imperfectly understood by the profession at large, and so incompletely and incorrectly treated of in medical works, there are none that cause more physical and moral suffering, directly or indirectly, to the patients themselves—*animasque in vulnere ponunt.*

Within the last ten years many and most important additions have been made to our knowledge of the pathology and treatment of venereal diseases—

additions which render plain what was before obscure and inexplicable, and which enable the surgeon to diagnose these affections with almost absolute certainty, and to pursue their treatment with confidence and satisfaction. Much has been learned, too, in regard to their history, and it is very curious to see how, after the expiration of so many years of discussion and experimental research, we are led to adopt the very identical opinions, in regard to the pathology of these diseases, that were universally held three centuries and a half ago. The distinction that is at the present day admitted between the three diseases which, from their origin in sexual intercourse, have been denominated venereal, namely, gonorrhœa, the contagious ulcer of the genitals, or chancroid, and syphilis, was fully recognized and taught at the beginning of the sixteenth century.

Among the most important of the recent additions to our knowledge of venereal diseases may be mentioned the distinct nature of the two species of chancre; the innocuousness of the secretion of the infecting chancre when applied to the person bearing it, or to any individual affected with the syphilitic diathesis; the removal of certain obstacles to a general belief in the contagiousness of secondary lesions; the fact that syphilis pursues the same course whether derived from a primary or secondary symptom, commencing in either case with a chancre at the point where the virus enters the system; the definite period of inoculation of the true chancre, and of general manifestations; the inefficiency of the abortive treatment of syphilis; and the phenomena of syphilization and their correct interpretation.

These additions to our knowledge of venereal diseases, with the investigations which have led to them, are scattered through the pages of medical periodicals, or contained in lengthy monographs devoted to one particular point in dispute; and a full and comprehensive treatise on these affections, written in accordance with the doctrines now received, is the book, at the present day, most needed in medical literature.

Dr. Bumstead's work furnishes the student with a full and comprehensive treatise upon venereal diseases, and also the practitioner with a plain and practical guide to their treatment. Knowing from his own experience, which has evidently been very considerable, that the success of treatment depends quite as much upon the manner of its execution as upon the general principles upon which it is based, he leaves nothing unnoticed that is calculated to assist the surgeon, or benefit the patient.

After an Introduction, containing a very interesting and instructive account of the changes in medical belief in regard to syphilis, the present volume is divided into two parts; the first devoted to gonorrhœa and its complications, and the second including both the chancroid and its complications, and syphilis.

The first part is divided into thirteen chapters. Each of the complications of gonorrhœa, swelled testicle, inflammation of the prostate, inflammation of the bladder, gonorrhœal rheumatism, &c. &c., is treated of in a separate chapter, and in the most thorough and satisfactory manner. The surgeon will find here all that he need desire to know in regard to these troublesome affections, both of their pathology and their treatment.

From his own observations, Dr. Bumstead is convinced that gonorrhœa is often due to accidental causes, and not to direct contagion. He has no doubt that it does at times originate in coitus just before, after, or during the menstrual period, or with a woman suffering from leucorrhœa, and, in a few instances, when nothing whatever abnormal can be discovered in the female genital organs, and the disease in the male can only be attributed to the irritant character of the vaginal or uterine secretions (p. 46). It is greatly to be regretted that this opinion, which accords with that of Ricord, Diday, and the best informed authorities upon the subject, is not universally held by medical men. The maintenance of a contrary opinion has repeatedly been the cause of great distress, and has even caused suicide and death.

The "abortive treatment" of gonorrhœa, Dr. Bumstead believes to be a highly valuable method of treatment, unattended with danger, and undeserving the censure sometimes cast upon it. It may, however, produce most unpleasant consequences, if not used with proper caution, and if not limited to the early stage of gonorrhœa, when the discharge is but slight, and chiefly mucus, and while as yet there is no severe scalding in passing water. The weak injection (one grain of nitrate of silver to six ounces of water), repeated every three hours until a sufficient effect is manifested, is much preferred by Dr. Bumstead to the strong one usually made use of. The directions given in regard to the cases in which the abortive treatment can be employed, and the manner in which the injections are to be practised, are excellent. As an example of this we will cite the directions for their administration, and this description of the method of using the syringe is, in the main, applicable to all the injections which may be required in the course of a gonorrhœa.

> "The patient should be made to pass his water immediately before injecting, or, better still, a quarter of an hour before. We wish to clear the urethra of matter, and to have the bladder empty, so that the injection may have some time to act before it is washed away by another passage of the urine, and yet a short interval between the last act of micturition and the injection is advisable, in order that as much of the urine as possible may have drained from the canal, and little be left to decompose the nitrate of silver. The prepuce should now be fully retracted, and the glans penis exposed. The latter should be wiped dry, so as to afford a firm hold to the thumb and forefinger of the left hand, applied to its opposite sides, and firmly compressing it around the point of the syringe introduced to its full extent within the meatus. If this pressure be properly made, not a drop of the solution will be lost, as the piston of the syringe is slowly forced down by the forefinger of the right hand holding the instrument, and the whole contents will be discharged into the canal. The syringe should now be withdrawn, and the fluid still retained for a few seconds by continuing the compression of the glans. When the injection is allowed to escape, it will be found to be of a milk-white colour. This is due to the partial decomposition of the contained salt by the remains of the urine and the muco-pus in the canal. As this decomposition has prevented the application of the injection in its full strength to the urethral walls, a second syringe-full should be thrown in, and retained for two or three minutes. During this time, a finger of the disengaged hand should be run along the under surface of the penis *from behind forwards*, so as to distend the portion of the canal occupied by the injection, and insure the thorough application of the fluid to the whole mucous surface." (pp. 57–8.)

For throwing injections into the urethra, the surgeon will find great advantage in using the syringes now manufactured from hardened caoutchouc. In these instruments, the diameter of the cylinder is in all parts the same; the piston works with great accuracy; the material is not acted upon by ordinary medicinal agents, and the different sizes and forms of the instrument are adapted to the various purposes for which it is required. Glass syringes are apt to be unequal in caliber in different parts of the cylinder, and the wadding of the piston contracts in drying, so that their use is attended with much annoyance, and the treatment seriously interfered with. In many cases of gleet the deeper seated portions of the urethral canal are involved, and for the purpose of reaching them with injections the "urethral syringe with extra long pipe," manufactured of hardened *rubber*, will be found particularly valuable. The long pipe may be bent to any curve desired, by first heating it over a spirit-lamp.

Part II. contains the best account of syphilis and of chancroid that is to be found in the English language, and it is, moreover, the only one that is fully in accordance with the results of recent investigations and discoveries. We doubt whether in any language so clear, thorough, and satisfactory a treatise on these diseases can be found, and it is very seldom we meet with a treatise on any subject that can equal this in style, methodical arrangement, closeness of reasoning, and full acquaintance with the facts concerned.

This part of the work is divided into eighteen chapters, devoted to Introductory remarks; Chancres; Affections of the lymphatic vessels and ganglia attendant upon primary sores; General syphilis; Treatment of syphilis; Syphilitic fever, state of the blood, and engorgement of the lymphatic ganglia; Syphilitic affections of the skin; Syphilitic affections of the appendages of the skin; Mucous patches; Gummy tumours; Syphilitic affections of mucous membranes; Syphilitic affections of the eyes; Syphilitic affections of the ear; Syphilitic orchitis; Syphilitic affections of the muscles and tendons; Syphilitic affections of the nervous system; Syphilitic affections of the periosteum and bones; and Congenital syphilis.

We conceive it impossible for any one to read the chapter entitled "Introductory Remarks," without being convinced that there are two species of chancre; one, a simple chancre, limited in its action to the neighbourhood of its site; the other, an infecting chancre followed by constitutional manifestations. Their duality is established upon the same evidence as that by which naturalists determine the identity of species in the animal and vegetable kingdoms; namely, by the immutability of certain traits in successive generations. Though the virus from both is called *chancrous*, there is but one *syphilitic* virus. Syphilis implies not only a local, but a general disease; conditions which are fulfilled only by the hard chancre and its consequent constitutional symptoms. The soft chancre, and its attendant bubo, should not, properly speaking, be described under the head of syphilis, but be considered apart like gonorrhœa, and though we venture to differ from Dr. Bumstead with great hesitation, we should have preferred not to see them described together in his work. Considered apart in medical works there would be less danger of their being confounded in practice.

The diagnosis of the two species of chancrous sore is, of course, a matter of the highest importance; the one being merely a local affection, while the other more powerfully modifies the constitution for the remainder of life than any known disease, and exercises a greater influence upon posterity. Their diagnostic characters are well set forth by Dr. Bumstead, as follows:—

THE SIMPLE CHANCRE.	THE INFECTING CHANCRE.
Origin.	*Origin.*
Always derived from a simple chancre, or virulent bubo.	Always derived from an infecting chancre or secondary lesion.
Anatomical characters.	*Anatomical characters.*
Generally multiple, either from the first or by successive inoculation.	Generally simple; multiple, if at all, from the first; rarely, if ever, by successive inoculation.
An excavated ulcer, perforating the whole thickness of the skin or mucous membrane.	Frequently a superficial erosion; not involving the whole thickness of the skin or mucous membrane, of a red colour, and nearly on a level with the surrounding surface. Sometimes an ulcer, when its

Edges abrupt and well-defined, as if cut with a punch, not adhering closely to subjacent tissues.	Edges are sloping, hard, often elevated, and adhere closely to subjacent tissues.
Surface flat but uneven, "worm-eaten," wholly covered with grayish secretion.	Surface hollowed or scooped out, smooth, sometimes grayish at the centre.
No induration of base unless caused by caustic or other irritant, or by simple inflammation; in which case the engorgement is not circumscribed, shades off into surrounding tissues, and is of temporary duration.	Induration firm, cartilaginous, circumscribed, movable upon tissues beneath. Sometimes resembles a layer of parchment lining the sore. Generally persistent for a long period.
Pathological tendencies.	*Pathological tendencies.*
Secretion copious and purulent, inoculable.	Secretion scanty, chiefly serous; inoculable with great difficulty, if at all, upon the patient or upon any person under the syphilitic diathesis.
Slow in healing. Often spreads and takes on phagedenic action.	Less indolent than the chancroid. Phagedena rarely supervenes and is generally limited.
May affect the same person an indefinite number of times.	One attack affords complete or partial protection against a second.
Characteristic gland affections.	*Characteristic gland affection.*
Ganglionic reaction absent in the majority of cases. When present, one gland acutely inflamed and generally suppurates. Pus often inoculable, producing a soft chancre.	All the superficial inguinal ganglia, on one or both sides, enlarged and indurated; distinct from each other, freely movable; painless, and rarely suppurate. Pus never inoculable.
Prognosis.	*Prognosis.*
Always a local affection, and cannot infect the system. "Specific" treatment by mercury and iodine always useless, and, in most cases, injurious.	A constitutional affection. Secondary symptoms, unless prevented or retarded by treatment, declare themselves in about six weeks from the appearance of the sore, and very rarely delay longer than three months.

Of course, while holding these opinions in regard to the pathology of the two species of chancre, Dr. Bumstead teaches that in their treatment, the internal use of mercury is justifiable only in undoubted cases of infecting chancre. When there is doubt as to the nature of a chancre, it should be treated as belonging to the simple species, and the patient should be kept under observation until the period of incubation of secondary symptoms has been passed in safety. A chancre which is not subjected to specific treatment, will generally, if at all, be followed by secondary symptoms within three, and at farthest within six months.

It is well determined at the present day that a considerable length of time may intervene between exposure and the appearance of the infecting chancre. One of the most conclusive cases we have yet met with, in evidence of this, is given by Dr. Bumstead at page 370–1. In this case it was not until the thirty-fifth day after exposure that a slight excoriation was noticed, though the patient had examined himself daily with the greatest care to see if he had contracted any disease. We have ourselves, at the present moment, a young unmarried man under care with an indurated chancre and induration of the glands in the groin; and from what he relates, and from what we believe, it was six weeks after sexual connection that he observed the first appearance of the sore, which is situated upon the external surface of the prepuce, on the upper part of the penis, where it could not have existed unobserved.

As regards the doctrine of the abortive treatment of chancres, Dr. Bumstead adduces a number of facts to show that destructive cauterization of an infecting chancre at a very early period of its existence does not prevent secondary symptoms, and hence that the system must be regarded as infected from the very first. In other infectious diseases, as vaccinia, glanders, etc., the absorption of the virus is instantaneous, and analogy would lead us to infer the same to be true of syphilitic virus. But although this argument from analogy is of very considerable weight, it is not conclusive, and the question can only be settled by facts. From cases recorded it must at the least be concluded that destructive cauterization *a few hours after the development of the chancre* has failed to avert constitutional infection, and that the abortive method cannot be relied upon.

In the chapter on General Syphilis, the question of the contagiousness of certain secondary symptoms will be found most ably discussed. The amount of evidence now brought forth to prove their contagiousness is so great that it can scarcely be doubted any longer; and we are ourselves as fully convinced of the transmission under certain circumstances of infection from a secondary sore as of any other fact in medicine.[1] Whether derived from a primary or secondary symptom, syphilis pursues essentially the same course; in the latter case, as in the former, the initial lesion is a chancre.

We heartily congratulate the profession on the possession of this treatise on venereal diseases, and we would also earnestly urge all practitioners, for their own pleasure and profit, and, more than this, for the great benefit of their patients, to avail themselves of the opportunity thus offered of making themselves acquainted with the important facts recently discovered in regard to the pathology and treatment of these affections. A very wise man who wrote nearly three centuries ago tells us that it is of great importance to have regard to the age in which one writes—"*il importe beaucoup de regarder en quel age on escrit.*"

The writer of the volume to which we have just called attention has the rare advantage of having acted in accordance with this advice in every respect; his work is fully up to the advanced stage of our science, and it is likewise the work which was most needed at the present time by the profession.

In the getting up of this volume the publishers have made the best use of the great facilities at their command, and have omitted nothing in the way of paper, letterpress, or illustrations, that could add to its appearance or its usefulness.

W. F. A.

ART. XII.—*A Course of Lectures on the Physiology and Pathology of the Central Nervous System.* Delivered at the Royal College of Surgeons of England, in May, 1858. By C. E. BROWN-SÉQUARD, M. D., F. R. S. Philadelphia: J. B. Lippincott & Co., 1860.

THE indefatigable and restless industry of Dr. Brown-Séquard has, from time to time, added many curious facts to our stock of knowledge, with regard to the functions of the nervous system. Beyond question, the most important of these acquisitions, which we owe to his genius and skill, are the discoveries which relate to the *transmission of the sensitive impressions* in the spinal cord. These impressions were almost universally admitted, for a long period of years, to be transmitted by the fibrous texture of the posterior columns. The double function of the cord, as an organ of transmission, was thus thought to be precisely similar to that of the two roots of the spinal nerves. As the anterior roots of the spinal nerves were demonstrated to be the organs of transmission for the motor stimulus, and the posterior roots for the sensitive impressions, so the anterior columns of the cord were regarded as the exclusive channels by which the motor stimulus was conveyed downward from the brain, and the posterior columns as the only means of communication by which sensations found their way upward to the sensorium. It was natural, accordingly, to consider the spinal cord, at least so far as concerned the white substance of its anterior and posterior columns, as nothing more than a bundle of fibres continuous with those of the nerve-roots; giving off, from time to time, motor fibres to the anterior roots, and receiving, from time to time, sensitive fibres from the posterior roots.

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[1] In the last number of this Journal is contained a very conclusive case of the kind, related by Dr. Clements, U. S. A.

An anatomical analogy was also found to exist between the anterior and posterior columns, in regard to the lateral decussation of their fibres. It had long been shown, beyond a doubt, that this decussation, for the anterior columns, must be located at the lower part of the medulla oblongata in front; the whole of the motor fibres of the right anterior column passing through the left side of the medulla oblongata, to the left side of the brain, and the whole of those belonging to the left anterior column passing through the right side of the medulla oblongata, to the right side of the brain. A similar decussation for the fibres of the posterior columns was pointed out, by various observers, at the upper part of the medulla oblongata, behind.

The physiological and pathological proofs of the locality of this decussation, however, were much less complete for the posterior columns than for the anterior. It was easily demonstrated that injury of one side of the brain produced paralysis, both of motion and of sensation, on the opposite side of the body; so that no doubt could exist of the complete decussation of both sets of fibres. But for the motor fibres of the anterior columns the precise spot of this decussation was indicated by the result of physiological experiment as well as by the researches of the anatomist. For while injury of the brain, as above mentioned, was always found to produce a paralysis of motion on the opposite side of the body, injury to the *spinal cord itself* on one side was followed by paralysis on the same side. Up to the level of the medulla oblongata, therefore, the motor fibres of the cord were shown to be in relation with the nerves and muscles of their own side of the body; above that level, with those of the opposite side. It seems to have been inferred a little too hastily that the arrangement of the sensitive fibres was a similar one, and that they all crossed over, from right to left and from left to right, at a single point, in the upper portion of the medulla oblongata, or just below the tubercula quadrigemina.

Dr. Brown-Séquard, however, has corrected this inference in a very important particular, by showing that the decussation of the sensitive fibres of the spinal cord takes place, not at a single point at or above the level of the medulla oblongata, but throughout the whole length, or nearly so, of its longitudinal extent.

The first experimental fact demonstrated by Dr. Brown-Séquard, in regard to this point, was a very unexpected one. He showed that if a complete section were made, in the living animal, of one lateral half of the spinal cord, paralysis of motion resulted, as previously demonstrated, on the corresponding side of the body below the point of section; but so far from the power of sensation being lost in the same parts, the sensibility of the skin and subcutaneous tissues *was absolutely increased* on the corresponding side of the body. Further experiments indicated that the increase of sensibility under these circumstances was owing to an unnatural congestion of the parts following the section of the nervous fibres. But the most important fact thus ascertained was that section of one lateral half of the spinal cord does not destroy the sensibility of the parts below, on the corresponding side. The conducting fibres of the sensitive impressions do not, therefore, like those of the motor impulses, remain connected with the same lateral division of the spinal cord throughout their course.

This question was still further elucidated by Dr. Brown-Séquard, by an experiment consisting in the double section of the spinal cord at different points. He divided, for example, the right lateral half of the cord in the lower dorsal region, producing, as above, *hyperæsthesia* of the right posterior extremity; and afterward, on dividing the *left* lateral half of the cord, in the same animal, in the *cervical* region, he found that the right lower limb, previously hyperæsthetic, lost, in consequence of the latter section, all trace of sensibility in the integument and subcutaneous tissues. Thus both the negative and positive results of those experiments pointed to an entire decussation of the sensitive fibres in the spinal cord itself.

This result was rendered more striking by combining a section of both posterior columns of the cord with a complete section of one of its lateral halves. Both posterior columns, for example, having been divided, there is hyperæsthesia of all the parts behind the point of section. Subsequently the section of the entire lateral half on the right side being completed, the hyperæsthesia on the *right* side seems to be increased, while on the left side, all sensibility has disappeared.

By a combination of various other ingenious operations the experimenter perfected his demonstration still more thoroughly. Perhaps the most simple and at the same time most striking of these operations is that which consists in a *splitting*, or longitudinal division of the spinal cord upon the median line. The spinal cord is laid bare in the entire lumbar region, and throughout the whole of that portion which gives origin to the nerves of the posterior limbs, a careful section of the cord is performed, along the median line, so as not to injure the substance of either lateral half, but simply to divide the middle and commissural portion of the cord. This is, of course, an exceedingly delicate operation, and, as the author acknowledges, it is not possible to avoid entirely slight accidental injuries to one side or the other. It may be accomplished sufficiently well, however, as he says, to give very distinct and very important results. These results are that the *sensibility of both posterior extremities is entirely lost*, while their voluntary movements remain nearly unimpaired, thus demonstrating at the same time the decussation of the sensitive, and the non-decussation of the motor fibres in this part of the spinal cord.

This experiment, as Dr. Brown-Séquard states, was performed many years ago by Galen, who failed to notice, however, its curious effects upon the sensibility of the parts.

Dr. Brown-Séquard, however, is not content with showing the fact of the decussation of the sensitive fibres in the spinal cord. He endeavours to establish the exact mode of this decussation and the entire route through which the sensitive impressions are conveyed upward to the brain.

In the course of his remarks on this question he takes occasion to discuss a very important point in regard to the proper mode of experimenting on the sensibility of the nervous system, and the conclusions to be drawn from certain results. This question is the following: *How are we to determine whether a particular part of the nervous system have or have not the power of transmitting sensitive impressions?* Dr. Brown-Séquard very properly remarks that certain experimenters have too readily taken it for granted that the true test for the existence of this power is the *sensibility or non-sensibility of the parts themselves.* They have supposed that a portion of the nervous apparatus which is itself sensitive must necessarily be the conductor of sensation from other parts; and, *vice versâ,* that a portion which is not sensitive cannot be a conductor of sensibility. They confound the two properties of transmission and sensibility, or regard them as necessarily coexistent.

Dr. Brown-Séquard, however, shows that there is no ground for such an assumption. The two properties mentioned above are quite distinct in their nature, and may exist separately or together, as the case may be. In point of fact, those parts of the nervous system which are sensitive, that is, in which painful or other sensations are excited by mechanical or galvanic irritation, are for the most part found to be also the conductors of sensibility; but the latter property is demonstrated by a different set of experiments from those which prove the existence of the former. We can ascertain whether a part be sensitive or not, by simply applying an appropriate cause of irritation, such as the galvanic current, and seeing whether a painful sensation be manifested in consequence. But in order to decide whether a part be the conductor of sensitive impressions from other organs, it is necessary to apply the irritation to these other organs, and to see whether its transmission to the sensorium be affected by the injury or division of the part under examination.

If this rule of investigation be applied, as Dr. Brown-Séquard contends, several parts of the nervous system, which are not themselves sensitive to external irritation, will be found to be undoubtedly the organs of transmission from other parts; since, if they be injured or destroyed, the parts below will be found to have lost their sensibility. This mode of experimenting becomes particularly valuable when it is claimed that such or such a part is the *exclusive* channel of transmission for nervous impressions. If the claim be a just one, the sensibility of the organs below must be *entirely* abolished by destruction of that part alone, the remaining connections being left untouched; and furthermore the transmission of sensations must remain perfect, provided that particular part be untouched notwithstanding all the other connections be entirely cut off.

Dr. Brown-Sequard does not believe that the posterior columns of the spinal cord are the exclusive channels for the transmission of sensitive impressions; and he thinks that this property has been too hastily attributed to them on account of their sensibility to external irritation—a sensibility similar to that possessed by the posterior roots of the spinal nerves, and which is not to be found in the anterior columns of the cord, nor in the anterior roots of the spinal nerves.

The author even seems to doubt the fact that the posterior columns of the cord possess so great an amount of sensibility as has been attributed to them. He thinks that this apparent sensibility has been exaggerated from two causes: first, that a galvanic shock applied to the posterior columns must necessarily irritate at the same time the posterior roots of the corresponding nerves, so that the sensibility of the nerve-roots, which is very acute, has been mistaken for that of the columns, which is doubtful: and, secondly, that irritation of the posterior columns gives rise very readily to *reflex movements*, which have sometimes been mistaken for signs of pain. Even in the decapitated animal, as the author states, the reflex movements excited by irritating the posterior roots of the spinal nerves, at the same time with the posterior columns, are much more decided than when the irritation is applied to the posterior columns alone.

We do not think, however, that the author is quite right in attributing the usually received doctrine in regard to the posterior columns as organs of transmission, altogether to their supposed sensibility to direct irritation. This remark is particularly applicable to what is said of Longet on page 15.

> "Mr. Longet," it is said, "thinks that the gray matter of the spinal cord cannot be a conductor of sensitive impressions, because it is not endowed with sensibility; and his single argument to prove that the posterior columns are the sole conductors of the sensitive impressions is that they are the only sensitive parts of the spinal cord."

Longet, in reality, adduces another, and, if we are to trust his results, extremely important observation bearing on this point. He says (*Traité de Physiologie*, vol. ii., part ii., p. 187):—

> "Some physiologists having considered the gray substance of the cord as indispensable to the transmission, not only of sensitive impressions (Bellingeri), but also of the principal of the voluntary movements (Van Deen, Stilling, &c.), we would here say that, in the dog, we have constantly found the gray matter at the same time destitute of sensibility and incapable of exciting convulsive movements under the influence of electricity and mechanical irritations; *and that its destruction, to as great an extent as possible, by means of a stilet, has not been found to modify, in any way, either the sensibility of the posterior columns or the excitability of the anterior.*"

But whatever is to be thought of Longet's experiments on this point, and the value of his mode of operating, there is no doubt that Dr. Brown-Séquard has pointed out, in a very effective manner, the full requirements of the question at issue, and the danger of trusting too much to results obtained from direct irritation applied to the posterior columns themselves.

By his own experiments also he has shown very strong reasons for the belief that the posterior columns of the cord, though they receive the posterior roots of the spinal nerves, do not exclusively transmit their sensitive impressions to the sensorium above.

We have already alluded to the singular hyperæsthesia which he has found to result from section of the posterior columns.

> "The first fact," he says (p. 19), "I have to speak of is, that a transversal section of the posterior columns, instead of being followed by the loss, or even a diminution of sensibility, seems to produce an increase in the amount of this property; in other words, I have found that the section of these pretended only channels of the sensitive impressions, instead of preventing them from passing, allows them, on the contrary, to pass more freely, so that instead of *anæsthesia* there is *hyperæsthesia*. In certain animals, and especially in rabbits and sheep, it is easy to ascertain that there is a very great increase in sensibility in the various parts behind the section. Before the operation, in rabbits, the most energetic pinching of the skin produces agitation, but no shrieking; after the operation, on the contrary, the least pinching produces shrieking and a much greater agitation. Sometimes the hyperæsthesia is so considerable that the

least pressure upon the skin makes the animal shriek. Whether the operation is performed in the lumbar, the dorsal, or the cervical region, the phenomena are always the same; that is, there is a manifest hyperæsthesia in the various parts of the body which receive their nerves from the part of the spinal cord which is behind the section. It has been so in all the animals I have operated upon, and I have already made this experiment upon animals belonging to more than twenty species.

As long as the animals live, after the section of the posterior columns, hyperæsthesia continues to exist, except in cases where reunion takes place between the two surfaces of the section; but hyperæsthesia is greater during the first week after the operation, than it is after a month or many months."

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"If we carefully dissect the two restiform bodies, so as to separate them from the neighbouring parts, and if we divide them transversely at their two extremities and then remove them, we find that the animal, instead of losing its sensibility in the different parts of the limbs and trunk, becomes hyperæsthetic.

It results, from these experiments, that the restiform bodies, which are the direct continuations of the posterior columns of the spinal cord, are not the only channels for the transmission of sensitive impressions to the sensorium.

It seems certain, therefore, *that the posterior columns of the spinal cord and of the medulla oblongata are not the only channels for the transmission of the sensitive impressions from the limbs and trunk to the sensorium.*"

Dr. Brown-Séquard, however, arrives, by further experiments, to much more complete results than the foregoing; for he finds that after dividing by a transversal section, the whole of the spinal cord, *with the exception of the posterior columns*, sensibility is lost altogether in the parts situated behind the point of division. The sensitive impressions, therefore, in the natural condition of the parts, are *wholly* conveyed by some other route than that of the posterior columns. This route, the author believes, is an oblique one; the sensitive filaments, derived from the posterior nerve-roots, passing for a very short distance after their joining the spinal cord, by the corresponding posterior columns, and then entering the central gray matter of the cord, in which they afterward cross to the opposite side of the median line, thus giving rise to the decussation or crossed action of the spinal cord, in the transmission of sensitive impressions.

The difficulty in establishing this fact lies in the want of any sensibility as resident in the central gray matter. But this has already been shown to be no objection to the truth of the author's conclusions. The gray matter may have the power of transmitting nervous impressions from below, though it may not itself be sensitive to direct external irritation. It is not necessary to suppose that the same sensitive filaments, derived from the posterior nerve-roots, pass continuously through the gray matter of the cord to be afterward connected with the sensorium above. They may terminate in the substance of the gray matter, which is in its turn connected, by commissural longitudinal fibres, with the ganglia of the brain. This anatomical arrangement, in fact, has been heretofore suspected to exist, owing to the small size of the spinal cord at its upper portion, as compared with the immense number of filaments which it gives off below to the spinal nerves. It was thought that the cord could not, on account of this disparity in size, contain all the filaments derived from or given off to the anterior and posterior roots of the spinal nerves.

The author asserts the power of the central gray matter of the cord to transmit sensitive impressions, from the results of experiments quite different from those obtained by Longet, to which we have already alluded. Let us remember that division of the posterior columns of white matter alone produces hyperæsthesia in the parts below, but no loss of sensibility; and that an increase of sensibility is also found to take place after division of the lateral columns. Now, Dr. Brown-Séquard finds that if a transversal section be made of the whole posterior half of the cord, in the dorsal region, so that, beside the posterior white columns and part of the lateral columns, a portion of the central gray matter is also divided, then there is a diminution of sensibility in the two posterior limbs. Since this diminution cannot have been caused by the division of the posterior or the lateral columns, it must have been owing to the partial section of the central gray matter.

Again, a similar section being made of the whole *anterior* half of the spinal cord, a similar partial loss of sensibility is found to take place in the posterior limbs, which cannot be the result of the injury to either the anterior or lateral white columns, and must therefore, as before, be attributed to the partial section of the central gray matter.

It will be seen that these experiments on the effects of section of the central gray matter are essentially the same with those performed by Longet, but yielding diametrically opposite results. Longet endeavoured to destroy the central gray matter of the spinal cord by the use of a stilet introduced longitudinally, leaving the white columns untouched; while Brown-Séquard divides successively the anterior and posterior halves of the gray matter, together with their corresponding columns of white substance, having previously ascertained that division of the white columns alone will not produce a loss of sensibility. We do not undertake to decide to what cause the discrepancy between the two is to be attributed.

The oblique course of the sensitive fibres, after their entering the spinal cord from the posterior roots of the nerves, is shown by successive sections of the posterior columns and of the gray matter. The author finds that, if the posterior columns of the cord be divided a very short distance above the point where they are joined by the posterior roots, these roots lose their sensibility—showing that, for this distance, it is transmitted by the posterior columns. If the section of the columns be made a little higher up, the sensibility of the posterior roots is diminished, but not destroyed—showing that at that point some of the sensitive fibres have left the posterior column to reach another part of the cord; and if higher still, the sensibility of the posterior roots remains unaffected, because all their filaments have now left the posterior columns, after passing for a time obliquely through their substance. But if the central gray matter of the cord be divided at this last point, according to Dr. Brown-Séquard, the sensibility of the posterior roots immediately disappears, since their organ of transmission has been destroyed.

It is by a combination of many ingenious experiments similar to those which we have quoted above, that the author fortifies his position, and makes it, at least, in the highest degree probable that the transmission of sensitive impressions in the spinal cord takes place by a continuous and oblique decussation, and through the substance of the central gray matter.

The first four lectures are occupied with the discussion of the above questions. Lectures 5th to 8th inclusive contain various conclusions of a similar nature deduced from pathological cases, which the author studies and records in close connection with his experimental observations. Among these are cases of alteration of the whole spinal cord with preservation of sensibility; cases of alteration of the gray matter alone, with loss of sensibility and voluntary movements; cases proving that the decussation of the channels of sensibility takes place in the spinal cord, and not in the medulla oblongata; cases of loss of voluntary movements in one side of the body, and of sensibility in the opposite side; paralysis due to disease of the gray matter; anæsthesia without paralysis, &c. &c.

The author recognizes very fully the complete distinction between the different kinds of sensibility—as, for example, sensibility to pain, to tactile impressions, to the effect of tickling, and to variations in temperature. It has been now for a long time known that these sensations are not the same in kind, but must be regarded as dependent upon quite distinct impressions upon the nervous system; for the sensibility to pain may be quite acute when that of ordinary touch is dull, and *vice versâ.* In fact, a painful impression, whenever it exists, actually interferes with the healthy appreciation of the qualities of foreign bodies by the sense of touch; and when the contact of a foreign body, by the suddenness or violence of its application or by the intensity of heat or cold, becomes painful, we can no longer perceive with any distinctness its true physical properties, but only the suffering which it produces.

Dr. Brown-Séquard has been led to believe that these different kinds of sensibility are not only distinct in their nature, but are actually *transmitted to the sensorium by different channels in the nervous system.* He does not, in the present work, give all the reasons which have led him to adopt this view, but he gives in the eighth chapter an analysis of certain cases of alteration in the spinal cord which go to show the probability of there being in this organ a special place of passage for some of these peculiar impressions. He believes that they all pass, however, by different channels through the gray matter of the cord.

These are: Cases of the loss of tactile sensibility, of the power of feeling pinching and pricking, and of the muscular sense, with persistence of the power of feeling cold and tickling. Loss of the power of feeling tickling or the simple contact of foreign bodies, with persistence of the sensibility to pain. Loss of tactile sensibility, with increased sensibility to painful impressions. Loss of the power of feeling heat, while tactile sensibility remains.

The ninth chapter is occupied with the sympathetic nerve and the effects of its division and galvanization on the circulation and state of sensibility in the parts beyond. It is well known that Dr. Brown-Séquard attributes all the results of this nature following division or irritation of the sympathetic nerve, to a temporary paralysis or contraction of the bloodvessels, and consequent change in the supply of blood circulating in the capillaries. This chapter, however, is more particularly of interest here, as being introductory to the succeeding one, in which the author speaks at length of the different kinds of reflex action as influencing, respectively, muscular contraction, the flow of the secretions, and the nutrition of the tissues. In each of these cases the reflex influence may be either positive or negative in its results—may produce either an increase or a diminution in the activity of the part. Thus we may have, in the case of the muscular system, either a reflex convulsion or a reflex paralysis. Reflex paralysis, in fact, is a subject which the author has made peculiarly his own, not only by bringing out distinctly the fact of its existence, but also by pointing out its different varieties, and by indicating the leading peculiarities of its treatment, as distinguished from that of ordinary or *direct* paralysis. In the same connection he speaks of the sudden arrest of the heart's movements, which sometimes takes place by a reflex action—the cause of rapid death after injuries of the abdominal sympathetic nerve—stoppage of the heart's movements by the application of cold to the skin, by the influence of cold drinks, and in some cases of death by chloroform—muscular atrophy due to an irritation of sensitive nerves, &c. &c. This entire subject of the various reflex influences at work both in the healthy and pathological conditions of the system forms an exceedingly varied and interesting topic for investigation. It has grown wonderfully since the first experiments were performed upon the reflex convulsive movements in the voluntary muscles due to irritation of the skin in a decapitated frog. It has been shown, in fact, to enter more or less fully into nearly all the functions of the living body, those of growth and nutrition as well as those of sensation and muscular activity. No one, it may fairly be said, has followed out this subject so fully, or pursued it so successfully into its varied ramifications, as the author of the present work.

The eleventh chapter is devoted to a subject closely connected with the preceding and naturally following upon it, but which is still more peculiarly the scientific property of Dr. Brown-Séquard, *i. e.*, the *artificial production of epilepsy in the lower animals.* One of the most curious results ever attained by experimenting upon the nervous system was that which excited the attention of the profession some years ago, when our author brought out his unexpected discovery that a convulsive affection, closely resembling if not identical with epilepsy, might be produced in the guinea-pig, in consequence of a mechanical injury to the spinal cord, usually in the dorsal or lumbar region. A few weeks after the injury of the spinal cord, and when the immediate effects of the operation have much diminished or have passed away altogether, epileptiform convulsions appear, and are repeated daily, or once in two or three days. But the most important peculiarity of the convulsions, in this connection, is that they can be excited at will by pinching or otherwise irritating a particular point of the skin, situated over the angle of the lower jaw. No other part of the integument, according to the author, is capable of exciting these convulsions on being irritated, and the irritation of this point is almost invariably followed by a fit, so long as the affection continues. Dr. Brown-Séquard has frequently demonstrated these curious facts, since their discovery, to the students and medical men who have attended his various courses.

The epilepsy in these animals is, therefore, a *reflex* convulsion; and the author, in applying the results of the experiment to pathological conditions, treats of epilepsy in general as a reflex affection, depending, very probably, in the first instance, on some injury or disease of the spinal cord, and afterwards excited, so far as regards each particular attack, by an impression produced upon the integument or some part of the mucous membranes. It is unnecessary to point out the extremely interesting nature of these hints on the nature and mode of access of epileptiform attacks, or the valuable suggestions as to treatment which may be derived from them. They are very fully followed out, in this and the following chapters, and will abundantly repay perusal, both in a practical and scientific point of view.

We are inclined to believe that the present volume will be found to be the most valuable and successful which has yet emanated from the fertile pen of Dr. Brown-Séquard. J. C. D.

Art. XIII.—*Rêlation Médico-Chirurgicale de la Campagne d'Orient, du* 31 *Mars*, 1854, *occupation de Gallipoli, au* 6 *Juillet*, 1856, *evacuation de la Crimée.* Par le Dr. G. Scrive, Médecin-inspecteur de service de santé des armées, ex-médecin en chef de l'armée d'Orient, &c. &c. Paris, 1857. 8vo. pp. 485.

A Medico-Chirurgical Account of the Crimean War, from the first arrival of the troops at Gallipoli, to their departure from the Crimea. By Dr. Scrive, Surgeon-General of the Army in the Crimea.

The study of the medical and surgical history of the English and French armies engaged in the Crimean war is eminently instructive. The collection of a very large number of troops in a small territory, and the stability imposed upon them by the necessities of the principal object of the enterprise—the taking of Sebastopol—while they were at the same time actively engaged and living as soldiers in a campaign, afforded a most complete opportunity of observing the development of the diseases of armies, with their special etiology and pathology. The presence side by side of the two independent armies, which, though engaged in the same enterprise, were completely separate in their organization, and at times very differently occupied, gave, moreover, an unusual opportunity of judging what part climate and season had in causing these special affections, and what part must be assigned to the abnormal conditions inherent to the life of a soldier. In surgery, also, the experience afforded by the campaign was most extensive. The number of serious gunshot wounds that occurred was enormous. The world never before witnessed such a display of physical and material force exerted for so long a time, for purposes of destruction.

The volume of Dr. Scrive gives a very complete medical and surgical history of the French troops engaged in the Crimean war during its whole period. From this history we design to take those facts and reflections that appear to us most interesting and most useful; when appropriate, we shall connect with them those given elsewhere by English observers, regarding the English troops; and we shall do this with reference to the actual condition of affairs in this country.

The Crimean war lasted, without any intermission, winter and summer, for twenty-four months. The total number of French troops sent to the East, at different times, amounted to 309,268 men, of whom 200,000 entered the ambulances and hospitals to receive medical aid; 50,000 for wounds, and 150,000 for diseases of various kinds. The total mortality was 69,229, or $22\frac{1}{3}$ per centum. Of these, 16,320 died of wounds, and nearly 53,000 from diseases. It is of these diseases we wish to speak first, and we shall see at once what part climate had in their causation and their atality, and what part the peculiar conditions of a soldier's life. The fol-owing table, taken from page 345 of Dr. Scrive's book, giving the statistics f the ambulances of the Crimea, will greatly aid in the comprehension of his question:—

	Entered.	Discharged.	Sent to Constantinople.	Died.
Officers wounded, ordinary wounds	135	104	31	None.
Officers with gunshot wounds	1,625	740	770	115
Officers with fever	1,098	401	503	194[1]
Soldiers wounded, ordinary wounds	5,582	3,168	2,154	260[2]
Frostbites	5,596	2,012	3,472	112
Soldiers with gunshot wounds	35,912	10,178	22,121	3,613[3]
Intermittent fever	6,983	3,746	3,197	40[4]
Remittent fever	12,267	4,036	6,436	1,795[5]
Pernicious fever	275	73	52	150[6]
Typhoid fever	6,351	1,060	1,628	3,663[7]
Typhus	11,124	1,266	3,840	6,018
Diarrhœa	19,339	5,240	12,115	1,984[8]
Dysentery	6,105	1,252	2,792	2,061[9]
Cholera	12,258	3,049	3,196	6,013
Scurvy	23,365	4,550	17,576	639[10]
Feverish	42,453	6,902	34,420	1,731
Venereal	1,455	1,201	241	13[11]
Itch	1,255	1,128	124	3[12]
	193,178	50,106	114,668	28,404

If we follow those sent from the ambulances of the Crimea to the hospitals of Constantinople, we have (at page 485) the following statistics:—

	From Varna and the Crimea.	By ticket.	Went out.	Sent to hospitals in Turkey or in France.	Died at Constantinople.
Wounded, ordinary wounds	2,185	1,007	2,059	720	413
Wounded by gunshot	22,891	None	9,619	8,190	5,085
Frostbitten	3,472	142	2,009	775	830
Typhus	3,840	4,889	3,544	1,778	3,407
Cholera	3,196	2,570	2,529	1,076	2,161
Scurvy	17,576	3,851	9,587	8,460	3,380
Feverish	63,124	8,038	35,625	22,988	12,549
Venereal	241	2,597	2,316	522	None
Itch	124	156	256	24	None
	116,649	23,250	67,541	44,533	27,825

Nearly 5,000 men died at Varna, at Gallipoli, and other places, before the troops reached the Crimea, a very large majority of them from the fearful outburst of the cholera in the Dobruscha. This number, added to 7,500, the number of those who were killed in engagements, or disappeared, together with those who died in the ambulances and hospitals, as stated above (56,229), gives the whole number lost by the French army.

Inspection of these tables shows that a very large proportion of the whole mortality is attributed to cholera, to typhus, and to scurvy, and great as it is, the true proportion of deaths directly caused by their presence in the army is very much greater, for all other diseases as also the wounds, to a very considerable extent owed their fatality to complication with one or more of these three affections. In the whole campaign Dr. Scrive says that 11,000 men died of cholera out of 18,400 cases (p. 406). The total number of deaths owing to typhus he computes at nearly 18,000 out of 35,000 cases (p. 421). The loss from scurvy, according to the tables given above, is but little over 4,000; yet while it only exceptionally caused death of itself, the consequences of its invasion upon the troops were most disastrous, by preparing the ground for other affections which, associated with scurvy, gave rise to a very large proportion of the mortality (p. 428). Another consequence of the presence of the scorbutic influence was the loss to the army, for several months, the time required for its treatment, of the services of a very large number of the oldest and best trained soldiers, who were those principally attacked. As is seen above, over 23,000 cases of scurvy entered the ambulances of the Crimea.

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[1] Many died of typhus and of cholera.
[2] Complicated with typhus.
[3] Complicated with cholera, typhus, and scurvy.
[4] From complications.
[5] Often complicated with typhus.
[6] Complicated with cholera and typhus.
[7] Many of these cases were typhus.
[8] Complicated with cholera and scurvy.
[9] Idem.
[10] Complicated with typhus.
[11] From complications.
[12] Idem.

Now of these diseases typhus and scurvy are undoubtedly *preventable;* that is to say, they are the effect of the action of causes that are known and that are under our control. Climate and season may interfere with our power of acting upon the causes of these diseases, but that is as far as their influence extends in the matter of their production. With proper food, good clothing, pure air, cleanliness, and sufficient rest, neither scurvy nor typhus fever can arise.

In cholera, the effect of the influence of the peculiarities and hardships of the soldier's life was seen, not in producing the disease as in scurvy and in typhus, but in enormously increasing its mortality. Cholera acquires an extraordinary power of destruction by association with ordinary great disturbing and disorganizing morbid causes, as ill-ventilated habitations, the concentration of animal and vegetable miasmata, overcrowding, great fatigue, excited passions, and painful privations—in other words, with the conditions almost necessarily attending the life of the soldier in active service.

It was while making forced marches, in the end of July, through the Dobruscha, a country without any resources, and infected with marsh miasma, that the cholera made its appearance among French.[1] By practising the three great principles of complete isolation, constant aeration, and permanent dissemination of the men affected, its ravages were checked at once. Three months afterwards, in the Crimea, after the battle of the Alma, the army was forced, from want of provisions, to remain on the field, which was covered with dead horses, putrefying and giving out an insupportable odour. The cholera burst out again. The climate of the Crimea was far from being favourable to the spread of cholera; on the contrary, again and again, when carried there by the arrival of troops from France and Turkey, it disappeared in a few days from the lack of conditions favourable to its development. (Scrive, page 86.)

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[1] We cannot here go into any particulars in regard to this fearful epidemic. To give an idea of its violence, we may state that in one day, in a single regiment, 300 men were attacked, almost all fatally. We will be excused, however, for copying from Dr. Scrive's work the following picture of the landing of the suffering troops, on their return from the Dobruscha, at Varna, where they were carried on steamers: "I never assisted at a more frightful spectacle than the one we witnessed on the beach at Varna, when these poor soldiers were landed, rendered unrecognizable by the terrible pestilence that had attacked them. Once in particular, it was evening, and the uncertain light of the moon added still more mournful shades to the picture. The sick were hoisted from the boats by sailors and deposited on the sand of the beach; some, completely collapsed, allowed themselves to fall heavily; others having preserved a remnant of strength, walked a few steps like drunken men, or crawled along on their hands, and soon fell motionless in their turn, from complete exhaustion of their strength. Some were naked, or almost naked, or only with pieces of dress thrown over them that did not belong to them. Officers and private soldiers lay together pellmell on the sand; all ranks were confounded in the presence of death. Many of them begged for drink in that broken, sepulchral voice peculiar to the disease; others cried out or groaned from the excruciating pain of the cramps. Those who died while being carried ashore were placed in a line on the bank, each one in the position in which the agony of death had left him." (pp. 79, 80.) What a picture this would be for the pencil of the great artist who represented the cholera on board of the Melpomène!

In fact, with the exception of the intermittent fevers caused by encamping for a period of time in the neighbourhood of the marshes of the Tchernaïa, fevers which when uncomplicated yielded promptly to simple treatment, there was nothing in the diseases of the French army that could be laid to the account of the climate of the Crimea, which is analogous to that of Corsica, of Italy, and of the south of France.[1] The extreme seasons, winter and summer, could have had no particularly bad influence upon the health of the troops, had they not been undergoing the fatigues, privations, and hardships of war. It can safely be concluded, therefore, both from the nature of the diseases by which the French soldiers were destroyed, and also from the universally admitted salubrity of the climate of the Crimea, that the great mortality among them was dependent upon causes inherent to the life of a soldier, in an active campaign, by which are comprised life in camp, the food furnished to an army, the clothing, the habitations, the concentration of large masses of men, and the fatigues, hardships, and moral effects of a war.

Very strong additional proof of the predominating influence of these particular causes in the production of disease during the Crimean war, is to be deduced from a consideration of the relative conditions of the English army at the beginning and at the end of the campaign. The English sent to the Crimea 93,959 men. Of these there were killed in action and died of wounds 4,446; the deaths from disease were 16,298; and 12,903 were invalided. The whole mortality was therefore over 22 per cent., or nearly the same as that in the French army. Now at least five-sixths of this mortality occurred during the first six months, from typhus, scurvy, frost-bite, dysentery, and diarrhœa, which had one common origin, namely, the exhaustion of the vital powers from overwork, inadequate night-rest, unsuitable clothing, inappropriate shelter against wet and cold, scarcity of fuel for cooking, unwholesome food, and insufficient nutriment. At the same time that the soldiers were dying so rapidly, the officers, exposed to the same weather and influences of climate, were more healthy in the Crimea than in England. During the second winter the health of the men was so perfect, that in the month of January, the deaths were only 124 in all the hospitals, regimental and general, in the Crimea and on the Bosphorus. The report for the week ending the 15th March, gives 70,409 as the total number of troops, of whom only 3,747 were under medical treatment, and the fatal cases on these seven days numbered only 19. At this time the influences of climate were the same, but the whole army was well clothed, well sheltered, and fed; while the military duties of the men served only for healthy bodily exercise.

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[1] To prevent as much as possible the action of the miasma from the marshes, the orders of Dr. Scrive were to keep up fires around the camp at night, to commence work late in the morning, to supply food and tonic drinks before proceeding to work, to wear flannel, to hermetically close the tents at night, to provide good food, and to allow the men to rest frequently while engaged in hard labour.

These facts in regard to the condition of the English forces we have taken from the several articles published in the *British and Foreign Medico-Chirurgical Review*, at the time of the Crimean war, or soon after its termination. In one of these articles, and a very ably written one it is, styled "The Allied Armies before Sebastopol,"[1] the writer discusses the question of the relative merits and demerits of British and French military administrative regulations in preserving and restoring the efficient health of soldiers in the field, and the conclusion to which he comes is that the extraordinary sanitary condition of the British troops during the last winter in the Crimea, while the French army was reduced three-fourths in numbers and efficiency by camp sickness, hospital destitution, and the failure of its medical administrative resources, is mainly due to the great superiority of the British military organization. Such a conclusion is, to say the least, a very unwarrantable one; but it was published when the war was over, and could produce no injurious effect, while it would be gratifying to see it proclaimed. In the beginning of the war, in the same Review (in the number for April, 1855) we read as follows:—

> "The deeply humiliating spectacle has been exhibited of a British army, unequalled in daring and discipline, perishing of want in the vicinity of abundance; naked and tattered within sight of stores of clothing; clothed, fed, and transplanted when sick, by a gallant and generous ally, to whose superior organization it owes its very existence."

Most unquestionably the true reason for the superior health of the English troops during the second winter is given by the reviewer himself a few pages preceding, where he says—as we have repeated above—that the whole army at that time "was well clothed, well sheltered, and fed; while the military duties of the men served only for healthy bodily exercise."

In fact, after the destruction of Sebastopol, in September, the English did no more than make themselves comfortable, while protected by the marches and counter-marches of the French. While the latter, a gun in one hand and a pickaxe in the other, were fortifying and defending a line of more than twelve leagues from Sebastopol to Baidar, three-fourths of the men on the watch all the time from constant alarms, obliged to go far to seek their wood, water, and provisions, the thermometer sometimes down to zero, and once even eleven degrees below (—24° Centigrade), with only *tentes creusées* and *huttes en torchis* for their habitation, the English were most comfortably installed in well constructed wooden barracks, thoroughly warmed and ventilated, well paved roads, and even railroads, bringing an abundance of fuel and provisions into the camp, and so many labourers from Turkey, Greece, and England, to do all the hard work of the camp that they equalled in number one-half of the army.

It does not accord with our object in writing this article to discuss at all the relative merits of the organizations of the French and English armies. It is, we are firmly convinced, a fact that cannot fairly be questioned that the greater mortality of the French army during the last winter was owing to the conditions we have just given, or in other words, to their being more exposed, and to an extraordinary degree, to the deleterious causes of disease inherent to a soldier's life, and we believe, moreover, this great mortality fell upon them in spite of their organization, of the character of which we have seen the English writer bear witness, since he states its superiority to have saved the perishing British army.

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[1] In the number for January, 1858.

The French military surgeons are eminently qualified for contending against the diseases peculiar to armies. They pass through a long course of study in special schools and hospitals, and they have had ample practical experience in their constant wars in Algeria and elsewhere. Their scientific merits, ardent zeal, self-denial, and absolute devotion, as manifested throughout the whole Crimean war, are beyond all praise. No suffering soldier ever wanted a dressing, a remedy, or a consolation. Of 550 that were necessary during the campaign, 83 were killed or died from disease. Dr. Scrive says, moreover, that there was not one single judicious measure advised by the surgeons that was not at once ordered to be executed by the chief of the administration.

If, therefore, during this war, notwithstanding all the skill and zeal of the medical men, eagerly seconded by the administration, the mortality from diseases was enormous, and these diseases were nevertheless mainly of a kind known as *preventable*, we see how very difficult it may become in an active campaign to overcome their causes, preventable though they be, and how readily armies are affected by them. These causes, as already said, are the vitiation of the air from over-crowding and from want of strict attention to cleanliness, improper food, imperfect protection from habitations, insufficient clothing, and over-fatigue. We will examine as briefly as possible the measures enforced by Dr. Scrive for counteracting these causes, and wherein and why these measures failed.

The greatest care was always taken by the surgeons that there should be a sufficient space between the tents to allow of free circulation of air; and that the kitchens, the stables, and the privies were removed to a sufficient distance. Every morning early, if the weather permitted, the clothing and bed coverings of the soldiers were exposed outside the tents, which were left widely opened, in order to allow the complete aeration of the ground, and of their being swept. In some places twice a week the tents were taken down in order to expose the ground most fully to the sun and air; in other places, this was not done so often. The rubbish of all kinds was every day taken to a distance from the camp and burned. Spots of infection in the neighbourhood of the camp were destroyed when possible by burning; if not possible, the disinfecting properties of sulphate of iron were resorted to. The sulphate was dissolved in water, in the proportion of one to fifteen, by weight, and three quarts were used to every square yard of ground. The burials were made three feet deep; if the nature of the ground was such as to make this impossible, the bodies were covered with quick-lime. The products of the slaughter-houses and of the sewers were treated in the same way. The tents or barracks were disinfected by using a solution of chloride of lime, one part of the chloride to twelve of water, stirred, and left to settle; one wineglassful of the clear liquid was placed in the tent, and this was done in the morning, so that the exhalation of chlorine might not annoy the men while sleeping. The tubs serving as privies had, every day after they were cleaned, a quart of the solution of the sulphate of iron thrown into them. Men attacked with infections or contagious diseases were completely isolated from the others, disseminated here and there, and provided abundantly with fresh air. When lightly attacked with typhus, six or eight cases were placed in a tent for sixteen men; when seriously attacked, only four. In cold weather a coal fire was kept brightly burning in the centre of the hospital tents or barracks for purposes of warmth and ventilation.

The food given to each soldier was, for every day—

Bread, 750 grammes ($1\frac{1}{2}$ lbs.), or biscuit, 550 gr. (nearly $1\frac{1}{8}$ lb.). Meat, 300 grammes (nearly 10 oz.), or salted pork (a little over $\frac{1}{2}$ lb.). Rice, 60 gr. (nearly 2 oz.). Sugar, 20 gr. (a little over $\frac{5}{8}$ oz.). Coffee, 16 gr. (a little over $\frac{1}{2}$ oz.). Salt, 16 gr. (a little over $\frac{1}{2}$ oz.).

Fresh meat was given four days in ten; salt pork, three days; and three days, preserved meat. The sick had fresh meat every day. An extra ration of wine was given every day, and also an extra ration of 100 grammes (a little over 3 oz.) of biscuit. Three times a week a quarter of a litre (or more than half a pint) of wine, or in its place one-sixteenth (a little over f℥ij) of brandy four times a week. Rice, beans, sugar, coffee, potatoes, and onions were sometimes given as substitutes to other things.[1] The dandelion, which grows very abundantly in the Crimea, was eaten as salad whenever it could be procured. When there was none to be had, in the severe cold of winter and the long-continued droughts of summer, its influence in preventing scurvy was manifest to a most surprising degree.

The whole army during the second winter, when the sickness was greatest, was in under-ground huts or under large tents; the small-sized ordinary tent was no longer used.

As to their covering, every man had a criméenne (a sort of hood), gloves, socks, long stockings of wool, Bulgarian gaiters, chéchias, wooden shoes, and overcoats of sheepskin for mounting guard and for any extra duty.

During the second winter, when the sickness was greatest, the French army was compelled to defend a line of more than twelve leagues. At every moment there were alarms keeping under arms three-fourths of the men. The enormous extent of the line of defence, requiring daily numerous *avant-gardes* and *grand' gardes*, rendered the provisioning of the army both difficult and fatiguing, and spread it out over all kinds of ground favourable or not to a winter encampment. In other words, the French troops were then subjected to excessive fatigue, in the most inclement season of the year, and in camping-grounds often wet and unhealthy; with habitations quite insufficient to protect them from intense cold, the humidity entering by the floor, the sides, and the roof, and containing too many men, thus reuniting the most favourable conditions to the production of cachectic and infectious diseases.

According to Dr. Scrive, the food of the French soldier, which, as is seen, does not differ materially from that of our own, should be reformed. When the live stock following the army became diseased, as was the case when it was attacked both by cholera and by typhus when these epidemics prevailed among the troops, or could not be transported to the seat of war, as was the case when the navigation in the Black Sea was prevented by violent storms, salted meat was all they had. Salted food, Dr. Scrive says, should be banished as much as possible from the provisioning of armies. The great progress of alimentary chemistry furnishes, at the present day, precious resources from which great profit might be drawn for the health of soldiers. If fresh meat cannot be had, it should be replaced by preserved juice of meat, concentrated soups, and boiled beef. These, he says, rendered accidentally immense service at the end of the Crimean war. He advises, moreover, that fresh vegetables, reduced by desiccation to a very small size, and which, with proper care, can be thus indefinitely preserved, should be regularly served in the rations of soldiers in active service, in equal parts with the rice and peas or beans. In this way a variety of food absolutely requisite to the human organization would be furnished, and the soldiers would be infallibly preserved from the scurvy. In modern times no case of scurvy need ever occur at any season of the year in an army, provided, of course, its communications are kept open.

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[1] The daily ration of the American soldier, which we place here for facility of comparison, is: Pork $\frac{3}{4}$ lb., or $1\frac{1}{4}$ lb. of fresh or salt beef. Flour 18 oz., or hard bread 12 oz., or $1\frac{1}{4}$ lb. of corn-meal. And for 100 rations he receives 8 quarts of peas or beans, or 10 lbs. of rice, 6 lbs. of coffee, 12 lbs. of sugar, 4 qts. of vinegar, and 12 qts. of salt. In campaigns, the quantity of hard bread is increased to 1 lb. Fresh beef is required to be furnished as often as the commanding officer may require, or at least twice a week.

Prophylactic measures against typhus are far more difficult of execution in an army, and sometimes, as in the Crimea during the second winter, they are impossible. Nevertheless, every possible sacrifice must be made to prevent its being engendered. Excessive fatigue must be avoided, the food must be good and the water drinkable, rules of general and individual cleanliness must be imposed, and the men must be placed where they will breathe a pure and renewed air. When it does break out, those attacked must be separated from the rest and scattered here and there in the most healthy spots that are accessible. In the Crimea, during the last winter, human means could do nothing; the weather prevented hygienic measures almost entirely, and there was no possibility of transporting the sick to other places, on account of the storms in the Black Sea. As to the extraordinary fatigues and hardships undergone by the French soldiers, these were rendered absolutely necessary by the exigencies of the war.

Together with the large armies sent by England and France to the Crimea, was a force of 12 or 15,000 men furnished by Sardinia. Their military organization is almost exactly the same with the French, and we see nothing additional to what we have already stated to be learned from their sanitary condition, except the great advantage they had, according to Dr. Scrive, from giving the entire direction of the hospitals, as regards the arrangements of the sick, the furniture, the kitchen, the pharmacy, &c., to the Sisters of Charity, who, he adds, can never be replaced by men, who have not the same feelings as women, above all, women animated by the sentiments actuating the Sisters of Charity.[1] (p. 302.)

Having now become acquainted, from the study of the medical history of the Crimean war, with the diseases from which an army in the field is liable to suffer, and with the extent to which it may suffer under unfavourable circumstances; and also with the causes of these diseases and the means to be adopted for their prevention, it remains for us to make what use we can of the information thus derived, and to endeavour to profit by it.

It is to be remarked, that all those difficulties to the removal of the causes of these diseases, dependent upon the great distance of the seat of war from the mother country, do not exist in this country, under present circumstances. It is only from ignorance, from want of zeal in the discharge of duty, or from fraud, that our men can be led to suffer in provisions, clothing, medical care, or hospital attendance. Well fed, well clothed, and protected from the weather, and properly cared for by the medical officers, no amount of fatigue they will be called upon to undergo, can ever be so long continued as to exhaust their vital powers and lead to a great epidemic. Upon those employed in furnishing, receiving, and distributing the necessary supplies of every kind for the army, and upon the medical officers attached to it, will depend, therefore, the health of our troops. As to the soldiers themselves, it is well known as a rule all the world over that they abandon themselves recklessly to the various chances of their fortune, good or bad, live from day to day, and neglect every precaution for preserving health. They require everywhere a superior direction, regulating by discipline all the physical and moral acts of their life. As to our volunteers, in the war with Mexico, we see that in a ten months' campaign the total loss was 21.31 per cent., or 2.13 per cent. a month, and their loss from disease relatively to that of the regulars was as 4.7 is to 1.

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[1] While cordially agreeing with what Dr. Scrive says of Sisters of Charity, we think it necessary, in order to avoid misunderstanding, to declare that there are serious objections to the employment of female nurses for soldiers. The experience of military surgeons has fully settled this question in the minds of medical men.

The necessity of scrupulous care in the selection of the medical men attached to our army is therefore most evident. In the way in which diplomas are given in this country, men become members of the medical profession who are altogether unequal to the duties they may be called upon to perform, even in ordinary circumstances. In civil practice this is not of very great importance, for the beneficial effects of competition correct the mischief. The public is at liberty to choose, and it is in a great measure their own fault if they suffer from falling into incompetent hands. The soldier, however, has no option in the matter, and he must submit to whatever the government may give him. A quantity of gilt-cording attached to their clothes, and the possession of two or three little books professing to treat of military surgery, though they are so small as to be readily carried in the pocket for easy reference, cannot render all the members of our profession fit for the duties they are to be called upon to perform. Before receiving an appointment in the army, they should be carefully examined by competent men. Moreover, we feel called upon to declare, that to preserve the health of the troops, it will be absolutely necessary to place every thing relating to their hygiene in the hands of members of the medical profession who have devoted their lives to such studies. Political demagogues, fanatical ministers, and strong-minded women, should be sternly repelled from intruding here. Too many lives, too great interests are now at stake.

Though our main object in writing this article is to call attention to the diseases by which armies are disabled, and to the means of preventing them, we will, before closing, make some brief extracts from what Dr. Scrive says on the subject of military surgery, or upon the care to be given to the wounded in engagements, and the treatment of gunshot wounds.

When the troops were engaged in besieging Sebastopol, as the wounded were brought in from the trenches they were directed by the administrative officer on guard into the tents *of waiting*, attached to the ambulances.[1] They were deposited in these tents in the order of their position as they became gradually filled, and in each tent they were placed in a regular order from right to left beginning at the entrance. One or more surgeons visited rapidly the wounded thus placed, and those whose wounds appeared to demand a severe operation were transported at once to two tents specially designed for the purpose. Simple dressings, or small operations to be quickly performed, were then executed, following the order in which the wounded had entered. The amputations and capital operations were performed afterwards when the crowding had ceased and the time they required for their careful performance could be more conveniently bestowed upon them.

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[1] An ambulance in the French service means an establishment for the temporary succour of the sick and wounded. It follows the movements of the troops for the purpose of affording the first attentions necessary. Each ambulance has at its disposal eighteen complete tents, a large quantity of bed furniture, and six hundred dressings for the wounded. Thirty-four men are attached to it, surgeons, apothecaries, administrative officers, and male nurses.

At the taking of the Malakoff, when, as was anticipated, the number of wounded was very great, the medical service in the ambulances of the trenches was thus constituted: on the left were ten surgeons, and in addition an *ambulance volante* to follow the assaulting columns; on the right, twelve surgeons together with an *ambulance volante* composed of four surgeons; at Karabelnaïa, ten surgeons and a third *ambulance volante*. As the wounded were brought in, they were placed regularly in groups; each group was dressed by a surgeon having under his orders two assistant surgeons, and three male nurses, one to carry apparatus, the second to assist the surgeons, and the third to write on a paper prepared beforehand the information given by the wounded man as to his name, his first names, his regiment, and his number, and also whatever the surgeon might indicate as to the nature of the wound. The wounded, so soon as dressed, were sent on litters or *cacolets* to the division ambulances. Those upon whom serious operations were thought necessary were carried to one place where certain surgeons especially appointed to this purpose performed these operations. The assault commenced on the 8th September, at half past twelve in the afternoon. At Karabelnaïa 900 wounded, and on the right 1,800 were thus attended to in less than eight hours; on the left, where the fighting began some two hours later, 660 were attended to in six hours, and by eight o'clock in the evening the division ambulances had each received its allotted share. On the right, where the struggle had been hardest, the wounded continued to be carried in during the whole night, and even on the following day. The whole number of wounded thus cared for at the capture of the Malakoff was 5,000, of whom 400 were Russians. By the 10th of September all the wounded had been dressed for the second time, and of 550 capital operations to be performed, 350 were already done.[1]

Among the gunshot wounds received in the Crimea were many of a new kind, produced by cylindro-conical balls, about which there was but little experience before that campaign.[2] The extreme swiftness of these balls makes them go through any organic tissue, however dense and resistant, without deviating from their course. In cases where soldiers were struck, creeping on the ground, these balls went straight from one end of a limb to the other, through bone and all, without changing their direction. Macleod, in his *Notes on the Surgery of the War in the Crimea*, says that one of these balls never comes to mark a bone with any touch more gentle than what occasions its utter destruction. The consequence of these wounds, according to Dr. Scrive, is a traumatic inflammation extremely violent, extending over a vast surface, leading frequently to strangulation and gangrene, and forcing the surgeon, if the injury be to a limb, to have recourse to the last means of saving life, to amputation.

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[1] The number of medical men upon whom this heavy labour fell was only 80, and they were compelled at the same time to attend to more than 5,000 other patients, sick and wounded, already in the ambulances. There was but one medical man to every 130 patients, and there should always be two to every 100.

[2] The rifle used by the Russians, according to Macleod, was little inferior in range or force to the Minié, while its conical deep-cupped ball was much heavier. Their range was 1,200 yards, and the weight of the ball 1 oz. 6 drachms; the Enfield ball weighs but 1 oz. 2 scruples.

In the treatment of the wounded among the French it was found necessary to have recourse at an early period to good, strong meat soups, roast meat, and generous wine; Port wine, above all, was used with great benefit.

As regards the local treatment of wounds: the immediate extraction of foreign bodies was always the general rule with the French surgeons. In cases of hemorrhage, the ligature was used for the obliteration of large vessels; astringents and cauterization for hemorrhage *en nappe*. Of all astringents, the most efficacious were solutions of the perchloride of iron and of the persulphate of the same metal. These salts, Dr. Scrive says, are worthy of being introduced into the materia medica of armies. The favourable results that followed the practice of removing constriction by long and deep incisions demonstrated the real benefits of the preventive dilatation of wounds. This practice, formerly so much insisted upon, has been generally abandoned of late years. Its advantages in remedying strangulation, excess of inflammation, the stagnation of pus and traumatic gangrene were seen in numerous instances.

The experience acquired in the Crimea on the interesting questions concerning amputations shows that, in war, these means of last resource must be largely applied. "If," says Dr. Scrive, "you hesitate in cases that appear doubtful, or if you place yourself a little too much on the ground of what is called conservative surgery, you are not long in repenting of it, and in seeing wounded men die in consequence of wounds that often amputation would have been able to save. Too often we made this sad experiment." (P. 461.) The same is the opinion of the English surgeon, Macleod, who says that it can hardly be doubted that one main cause of that mortality which attended compound fractures of the limbs was the great striving after conservatism, which influenced all the surgeons of the British army.

Primitive operations were the most successful in the French service, and the proportion of their success surpassed sometimes one-half, sometimes two-thirds, the favourable results of consecutive amputations. The experience of the English in favour of early operations was also, according to Macleod, unequivocal, and such as to require no illustration.

The experience of the Crimean war, both in the English and the French armies, is therefore most decidedly in accordance with the teachings of Hennen. This excellent surgeon says: "*The sum of human misery will be most materially lessened by permitting no ambiguous cases to be subjected to the trial of preserving the limb;*" and, moreover, as respects the time of operating, *operate with as little delay as possible.* The Italics are as we find them in the original edition of Hennen's work.

Dr. Scrive makes one exception to the rule of primitive amputation, and that is in the operation at the hip-joint. This he is convinced is always fatal if practised primitively, by which he means within two or three days after the receipt of the wound. In nine cases where it was performed primitively, the patients all died at the time of the operation, a few minutes or a few hours afterwards. In three cases where the operation was performed consecutively, one lived five days, one twelve, and the third twenty, and under better conditions he is satisfied that the patients would have entirely recovered.

Resections were tried a very great number of times. Generally they did not succeed, with the exception of a certain number of those practised upon the upper extremity, and principally the resection of the head of the humerus, which seems to enjoy great privileges in this respect, and to furnish frequent examples of success. All those tried on the lower extremity, even in the diaphysis of the bones, generally failed; and the same is true of the greater part of the trephinings of the cranium. The experience of Macleod in the use of the trephine is the same; of twenty-eight cases in which it was used in the English army, twenty-four died.

Of chloroform, Dr. Scrive says that the benefits derived from its use were immense. Although it was used in thousands of cases, it never caused the slightest serious accident. Not only was it used to obtain complete insensibility in every important operation, but also to render more supportable the pain from wounds altogether desperate, and to calm nervous and irritable persons, the dressing of whose wounds occasioned much suffering. A special apparatus was employed in its administration, by which the dose was exactly measured, and that allowed a proper intermixture of air and chloroform. When insensibility was produced the apparatus was withdrawn; complete relaxation of the muscles was never reached. Given in this way, with reserve and prudence, to insensibility and no further, Dr. Scrive states that, far from adding to the general stupor of a patient severely wounded, it excites favourably the depressed nervous system, rouses up the circulation rendered slow and weak by the general shock, while destroying at the same time the enervating sensation of pain.

Great resistance of the wounded to anæsthesia a day or two after the reception of the injury was frequently remarked. A much larger dose of the chloroform was necessary before insensibility was produced, and the period of excitement was so strongly marked that several men were often required to hold the patient. To avoid this over-excitation produced by traumatism, the rule was observed to amputate as much as possible the very day of the wound. When consecutive amputation was necessary from gradual sinking from suppuration, anæsthesia was effected with the most perfect tranquillity.

We here conclude our task of endeavouring to extract from this valuable work of Dr. Scrive that medical and surgical information which seemed to us most useful and applicable, both directly and indirectly, to our country in the present condition of affairs. We might have made many and most just animadversions in regard to the manner in which the sanitary condition of our volunteer troops has so far been attended to, but all this we leave to others more competent and more willing than ourselves to perform the task.

W. F. A.

ART. XIV.—*A Treatise on Diseases of the Joints.* By RICHARD BARWELL, F. R. C. S., Assistant Surgeon, Charing Cross Hospital, &c. Illustrated by engravings on wood. Philadelphia: Blanchard & Lea, 1861. 8vo. pp. 463, with index.

THE author of this work has admirably satisfied a want which has long been seriously felt—that of a treatise on diseases of the joints, as he expresses it, "equal to or rather beyond the current knowledge of the day." Some familiarity with the London publication, of which the copy before us is a faithful and handsome reprint, has convinced us that Mr. Barwell's pages fully justify the modest hope expressed in his preface. Not only do they supply the acknowledged deficiency in their ample exhibition of the current knowledge, but they have gone decidedly beyond this in originality of views, and in methodizing and illustrating matters of pathology and therapeutics which have not hitherto been brought within the reach of professional readers, especially in so clear and practical a form, except in detached and fragmentary essays.

His treatise is the result of his well-known practical devotion to the subject, under the best influences and opportunities, during a period which has been distinguished for material progress in the comprehension and management of articular diseases; and it has the benefit of his own investigations into the physiological and the morbid anatomy of joint structures, which have already established his reputation in connection with the study of these important affections.

The leading and most meritorious characteristic of the book is its thoroughly practical and straightforward mode of conveying instruction. The author alludes to his anatomical researches and to the consequent demonstrations given, as a part of an indispensable course of investigation preliminary to the great object of inquiry; but the real weight of his work, he tells us, "has been at the bedside, and the greatest labour devoted to interpreting symptoms and remedying their cause." This combination of clinical and anatomical observation, extended as it is, and enlightened with much careful reading drawn from a wide range of sources, would render Mr. Barwell's treatise an acceptable one upon any more familiar theme. In the present instance it has enriched our literature with an unusually valuable contribution upon a difficult and always exacting branch of surgical science and art, in which such a reliable and candid regulator, in the midst of great advance, has been sadly needed on both sides of the Atlantic.

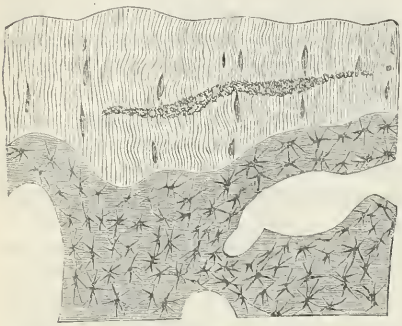
Chapter I. is occupied with the physiological anatomy of the joints. The whole subject is clearly and amply exposed and illustrated in the course of some twenty-five pages, which afford a very useful introductory to the subsequent chapters. Of these, the first eight are devoted to the consideration of the affections which involve the lining membranes only of the joints, and constitute, with the preliminary chapter, the first of the two parts into which the volume is divided.

The second part, consisting also of nine different chapters, treats of the diseases of the joints which have their origin in the bones. Under this general head we find the most interesting class of joint affections, although some of them, such as hip-joint disease, can hardly be regarded as invariably "commencing in the bone." The division is one of mere convenience, however, as it is one of the advantages of the volume, that the author is not bound by logical requirements at the expense of practical utility. He does not hesitate to treat of coxalgia in the latter portion of his book, although it may sometimes commence as a synovial disease; and he devotes a special chapter to this affection, for the sufficient reason that the separate discussion of the diagnostic signs of hip-disease would increase the value of his book.

The chapter on the physiological anatomy is extremely interesting. Without dwelling upon unnecessary details, he omits nothing that is essential to a thorough understanding of the peculiarities of structure, as he views them, and applies them in his subsequent expositions of the pathology. These views and applications are based upon independent and sometimes highly original observations. They are ably sustained, and are entitled to great respect, notwithstanding their occasional variance with the current theories. We can only glance at some of the more prominent. First, in regard to the structure of the articular lamella, previously described and represented by the author in his paper on the subject in the *Med.-Chir. Review*, for Oct. 1859. We quote his language, with the marginal engravings accompanying the description.

"It in reality consists of a series of very minute parallel tubes, which run in a wavy course from the bony to the cartilaginous surface. Among these, but having no special, if any, communication with them, are the bodies mentioned by Kölliker as undeveloped bone cells. In some sections—those, namely, which are not made quite parallel with the axis of the joint from which they are taken—the tubes of the articular lamella cannot be made out, but the section is minutely dotted, from those tubes having been cut across. Fig. 3 is a tolerably successful representation of this structure. It will be seen that certain portions of the articular lamella are rendered darker than others, and this is a condition very difficult to account for; yet perhaps I may pretty confidently affirm that it arises from the tubular structure having become so bent in those lines that the canals have been cut through, giving a brown, darker, and finely-mottled character to that part. This structure is similar in every mammal in which I have examined the lamella, but perhaps it is plainer in the rabbit than in any other I have yet seen.

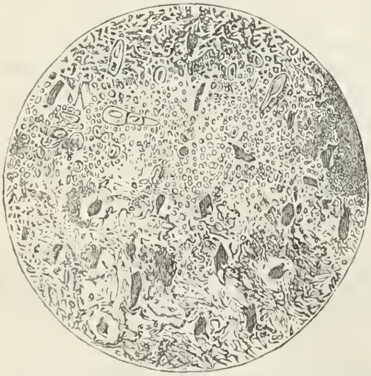
Fig. 3.



Cancellous structure and articular lamella from upper end of the human humerus, showing tubular structure of the lamella, magnified 500 diameters.

"Having thus succeeded in ascertaining the structure, as seen laterally, it seemed advisable to view the same part from above; for this purpose a joint end, with as flat a surface as possible, was chosen; either end of the tibia in most animals answers this purpose sufficiently: the cartilage being scraped away, a small piece of the articular lamella was detached, and ground thin enough to be transparent. In this view the black spots or undeveloped bone-cells are less elongated, all the rest of the section is studded with dots, which, under a sufficient power, and where the section is very thin, appear as small round holes. This structure is the same in all animals that I have examined. (Fig. 4.)

Fig 4



Articular lamella, section parallel to surface, from lower end of human tibia, magnified 700 diameters.

"Thus the articular lamella is not an impervious material; but perhaps this account, which I have allowed to stand from my first paper on the subject, might have produced less opposition had the wavy lines which run through the section been named something different to 'tubes.' As far as the bony material is concerned they certainly are tubes, but I do not, and never did, conceive them to be lined by a tubular membrane—probably by compound fibre, or whatever form of fibrous material the altered cartilage may take. The

> channels, running from the deep or osseous to the superficial or cartilaginous surface of the lamella, permit the passage of nutrient fluid from the bone to the deep surface of the cartilage. This is the one important point—it is immaterial what the channels, through which that fluid passes, be called, whether tubes, osseous intervals, or any other name, as long as it be fully understood, that there is a mechanism permitting fluid to permeate the structure and to nourish the cartilage from its deep surface.
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> "That part of the epiphysis, which remains unossified towards the joint cavity is thus separated from the ordinary bone tissue, and now becomes articular cartilage. It is not, as it has often been said to be, attached to the bone, but it is continuous with it: it is part of the same thing, one portion having received a deposit of lime, the other portion not having done so." (pp. 25, 26.)

He does not believe, with some observers, in the vascularity even of fœtal cartilage; nor is he able to discover epithelium overlying the cartilaginous surface. The only source of nourishment and growth is the attached surface through the articular lamella.

Next, as to the synovial membrane, the arrangement of which has been much disputed:—

> "Some persons have thought that it was prolonged over the face of the cartilage; others, that it went between the structure and the bone; and some even have supposed that it was split, and that a lamina was placed in either situation. Some believe that the membrane is prolonged over the cartilaginous surface until the movements of the joints wear it away. My own conviction is, that at no period is the cartilage covered by synovial tissue, but that the membrane becomes lost very near the edge of the cartilage. In no young animal will any structure be found like a fibrous, or even a homogeneous membrane on the cartilaginous face, and the last layer of cells cannot be regarded as appertaining to a prolonged synovial membrane, since it is very evidently the result of a gradual process of change, and is the arrangement towards which all the corpuscles and cells tend even from their very deepest layers. Histologically, the synovial membrane and the apparatus of bone and cartilage previously described are exact parallels; the former consists, as just related, internally of cells, then of a fine membrane permitting fluids to pass through from a vessel-bearing subserous tissue. The whole cartilaginous apparatus consists of cells (with an intercellular substance), then of a fine lamella, permitting fluids to pass from a vessel-bearing tissue. These structures, or rather set of structures, being analogous, it is hardly conceivable that nature should permit such a tautology as to prolong the one over the other." (pp. 29, 30.)

The last point which we are able to notice is the theory of the synovial vacuum, based on the experiments of Weber. These experiments are criticised by the author, and successfully controverted by four experiments of his own, which are described in full. He also cites a curious case observed by him of a man who had an opening into the synovial membrane of the elbow-joint, through which the air passed in and out with the motion of the forearm; and yet, notwithstanding much hard work and climbing as a sailor, he exhibited no tendency to dislocation.

> "The whole vacuum theory is untenable; the only fact which at all resembles it is, that cohesion of contact takes place between the joint surfaces, but this is not a vacuum: a vacuum is a space containing neither air nor other material—the cohesion we speak of takes place when there is *no space* between the parts interested.
>
> "The fact is, that every joint has some special means, which hold the bones forming it in close contact, and such aids as atmospheric pressure may yield are but slight in comparison with these. Certainly no man gifted with a tolerable appreciation of cause and effect could regard the enormous power of the muscles passing from the scapula to the tuberosities close to the head of the humerus without considering that their tonicity alone would be of large effect in

keeping the head of the bone close against the glenoid cavity. Any one attempting to resect the head of the humerus in the dead subject cannot fail to remark their effects, even as lifeless flesh; and moreover he will find the ligaments and the tendon of the biceps and other parts of the greatest importance. Again, if the rotators of the hips and their direction and attachment be considered, their importance will not be slightly regarded, and besides these the psoas, iliacus, and glutei, in fact every muscle attached to femur and pelvis, have the same effect. Add to this the resistance of the cotyloid ligament, which forms a smaller circle than lies within the cavity, and therefore clips in the bone like a circular clamp, and we have quite enough to account for the difficulty in dislocating the bone.[1] Besides, there is the round ligament, which in certain positions takes considerable part in holding the head of the bone in the acetabulum.[2] The knee, elbow, all the joints in the body, have arrangements either of muscular force or ligamentous resistance for keeping the articular surfaces in contact. By this means only, viz., actual contact of the bones, can any assistance from atmospheric pressure be obtained. A vacuum, *i. e.*, a space unfilled by air between the bones, could not be maintained: either the surrounding parts must be forced into such space or the bones would be squeezed together, for there is nothing to keep them asunder, and so the space would be annihilated." (pp. 35, 36.)

Acute synovitis in its various forms, the pathology, symptoms, and treatment, are well discussed and demonstrated in Chapter II. We do not remember a monograph on any form of disease which presents a better exhibition of its subject, or a greater amount of pathological and clinical instruction. The very first paragraph is worth quoting on account of the comprehensive view it gives.

"A joint is, as the preceding chapter has shown, a very complicated apparatus, constructed of different tissues of different qualities, hard, soft, and elastic, serving different purposes. Yet they are all reducible to one form or class of tissue—the connective. Those different parts are so closely placed, and are so interdependent, that one cannot long remain sound while the others are undergoing any active morbid change. But some of the structures are more liable to disease than others, as indeed it must happen that those parts which undergo much action are, *cæteris paribus*, more likely to get some of it deranged: and such derangement is more likely to set up rapid disease than when the action is very slow, as a railway train going at the rate of sixty miles an hour is at least six times as likely to meet with an accident during that hour as one which goes at ten in the same time, and that accident is more likely to be severe. We shall be able to show clearly that the structures which are liable to primary diseases are the synovial membrane and the bones. From either of these points the malady may spread to every other part of the joint; therefore, after either has been affected for a certain time (synovial membrane or bone), the other becomes involved. Hence neither synovitis nor osteitis are utterly different throughout all their stages, because in the far advanced conditions the one disease will be more or less mingled with the other.

"The present chapter will be devoted to primary acute synovitis: a disease which perhaps acknowledges more causes than any other simple malady in the range of pathology, and which therefore may be divided into an almost indefinite number of sub-classes, each with its proper expletive affixed. Perhaps the clearest way of showing this would be to relate one or two cases."

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[1] "In my Experiment II. the weight hung on the pulleys produced a force sufficient to overcome this ligament and open it out; subsequently, therefore, whether or not air was admitted into the cavity, the head of the bone fell out on the application of the force."

[2] "The reader is referred to a paper by Dr. John Struthers, in the Edinburgh Medical Journal, vol. iv. 1858–9, p. 43, for a particular account of the use of the round ligament. It appears that the position *par excellence* wherein this band may act as a check ligament, is rotation outwards with flexion. It is rendered nearly tight in adduction with flexion, and in adduction with rotation either inwards or outwards; but only in the first-named position does it bear the strain."

He then reports five different cases in detail, each from a different cause, and with different general symptoms, the inflammation of the synovial membrane being that alone which they have in common, although, locally, the morbid action is, up to a certain point, very much the same in each.

The sixth case related is a rare instance, in which death from injury afforded an opportunity to examine pathologically into the changes produced by a simple acute synovitis in the early stage. The man died on the fifth day. Mr. Barwell made a careful observation of the knee, and describes the appearances in the following words:—

> "The joint contained about an ounce and a half of synovia, which was slightly turbid, opalescent, and in which floated shreds of false membrane, some semi-transparent, others opaque and white; these latter being more evidently fibrous; one of the shreds was loosely attached by one end to the synovial membrane, the rest floating freely in the fluid. The whole membrane was intensely injected, the vessels not being on the surface, but as though visible through the film; in some parts the injection was much more violent than in others; the deepest in colour were the fringes around the patella, the so-called alar ligaments, and the subcrural cul-de-sac; in many spots of these parts were actual extravasations, which, again, were not on the surface, but beneath a fine film. In the less injected parts of the membrane long tortuous vessels could be distinctly traced. The surface of the membrane itself was finely roughened; on holding it up and looking towards the light over the surface, it was seen to be covered with papilla-like or velvety elevations; it looked like the surface of the duodenum when the valvulæ conniventes are straightened out. The membrane was easily torn, and very easily stripped from the underlying tissue, which was highly injected and infiltrated by a turbid serum.
>
> "On the inner condyle of the femur was a spot as large as a sixpence, whence the cartilage had entirely disappeared; the edges of the ulcer were perfectly smooth, sharp, and clean. The rest of the cartilage was entirely healthy." (p. 50.)

The section on the treatment, like all the rest, is admirable and full of practical hints. We can only refer to his remarks on the resort to free incisions in suppurating joints as advocated ten years ago by Mr. Gay, and long before by Petit, Boyer, and others on the continent. Mr. Barwell cordially approves of this plan and refers to the French authorities in support of it, giving the usual reasons for regarding it with favour, and insisting on free and always dependent incisions. There has, doubtless, always been more or less hesitation, even among well informed surgeons, as to opening suppurating joints, and this still exists notwithstanding what has been said in its behalf for some years past; but we are glad to see Mr. Barwell distinctly referring to the practice as an old one, since it has been claimed in this country as a recent improvement. We remember it as regular practice in France, at least twenty years ago; and years since have heard it advocated, on our side of the Atlantic, as not only safe, but the only rational method of dealing with the articulation in a state of abscess.

Chapter III. is a short one on acute rheumatism, the chief object of which appears to be to show from the local changes, as well as other data, that the local affection of the joints in this disease is inflammatory. In this he successfully combats the dogma of Dr. Todd, that "rheumatic fever is not symptomatic of local disorder," so far at least as the joint affection is concerned, by careful reasoning as well as by the more decisive logic of morbid anatomy. Five cases are reported, in which the local examination sufficed to prove the inflammatory nature of the changes, and to illustrate the morbid anatomy of articular rheumatism.

> "These cases suffice not only to prove that the disease in the joints is inflammation; but also to illustrate its morbid anatomy, viz., inflammation of, and

effusion into, the synovial membrane, and the periarticular tissues, followed by thickening of those parts. In severe cases the effusion becomes opalescent, even puriform, and the cartilages partake in the inflammatory action. The metastatic quality of this inflammation is very remarkable, but the description given of the sudden disappearance of all morbid symptoms is usually exaggerated; for although there can be no doubt that the inflammation itself changes places with extreme rapidity, it is not true that the part lately affected is left in a perfectly healthy condition; on the contrary, considerable swelling still remains, and disappears more or less slowly according to the greater or less amount of effusion and thickening. On the symptoms of this disease I shall not enter, as it belongs to the physician; but it is well to observe that the surface of the joints are redder than in any other form of arthritis, showing that the areolar tissue is more widely involved, so that even the subcutaneous layers are inflamed and the effects do not always disappear with the fever; but sometimes a joint, generally a large one, as the knee or the elbow, is altered, and requires considerable attention and care; sometimes, even in spite of all that art can do, the limb can never be recovered." (pp. 88, 89.)

Pyarthrosis, strumous synovitis, rheumatic synovitis, other forms of chronic synovitis, including syphilitic, gouty, and simple, hydrarthrosis, and loose cartilages in the joints, complete this portion of the series of synovial disorders, and are duly considered in the remaining six chapters. These different articles are all worth a careful study, and contain so much that is practically useful as well as philosophical, that it is difficult to particularize. We have been most interested in the chapter on strumous synovitis as especially exhaustive and lucid in its pathological and therapeutic reasoning, its illustrations and description of the structural changes and appearances. Were it the purpose of this article to present a regular analysis of Mr. Barwell's treatise, or to attempt anything more than to interest our readers in his work, by giving some idea of its high character and the peculiar value of its contents, we should feel obliged to dwell upon this portion of his pages as among the best of the book. The amount of positive instruction in regard to scrofulous diatheses and diseases, generally, contained in this chapter, its graphic portraitures and sensible directions for the treatment of these ever-dreaded forms of human ailment, ought alone to secure the grateful attention of American practitioners; since there is not one who can escape the responsibility under which its precepts and demonstrations, and individual prescriptions, would afford him signal aid and comfort.

The nine chapters of the second part treat, respectively, of acute articular osteitis (in a general account), of strumous articular osteitis, chronic rheumatic arthritis (osteitis), inflammation and degeneration of cartilages, hip-joint disease, affections of synovial sheaths and bursæ in the neighbourhood of joints, hysteric pseudo-disease of the joints, the restoration of mobility, and conformity to crippled joints; and lastly, the removal of diseased joints.

Of these, the most important and interesting are Chapter XI. on strumous articular osteitis—which resembles the corresponding one on strumous synovitis in extent and character, and goes even beyond this in the completeness of its pathological details and comparisons, and the practical value of its therapeutic teachings; Chapter XII. on chronic rheumatic arthritis; Chapter XIV. on hip-joint disease; Chapter XVII. on the restoration of crippled joints; and Chapter XVIII. on the removal of diseased joints.

In discussing strumous articular osteitis, the difference between caries and necrosis, and the peculiar changes which characterize them, the course of scrofulous inflammation in the bones and adjacent structures, and the attendant muscular spasm, are described with great care and fulness. Under the head of symptoms are particularly well shown the diagnosis, first, between strumous synovitis and osteitis; secondly, between necrosis and caries in the joint end of a long bone during the earlier stages; and lastly, between necrosis and caries in the joint end of a long bone during the later stages. In each class the differential diagnosis is summed up in a tabular form, so as to present the distinguishing points at one view.

A good idea of the author's practical discrimination may be formed from the following paragraphs, in which he particularizes in regard to the mode of dealing with strumous osteitis in different constitutions.

"Sir B. Brodie, from whom no writer of the present day would willingly differ on the subject of joint disease, has discussed the subject of treatment too generally, and his remarks refer, I believe, to a further advanced period than the early one, now under our consideration. The earliest condition (marked by mere pain, reluctance or inability to move the joint, and some not easily perceptible swelling, while yet there is no muscular spasm or starting pains at night) should, in all but the most feeble constitutions, be treated, I am quite sure, more actively than he has advised. Two classes of cases come under our notice—the one very chronic, the other less so; either may occur in delicate, and pale, or in fat and florid, children. Such circumstances make a difference in the kind, but scarcely in the vigour of the treatment to be adopted. At p. 129, two forms of struma were described; at p. 147, the treatment best adapted to each. Now, although either strumous state may light up an inflammation in any tissue of the body, the slow, long-pending osteitis belongs especially to the coarse clumsy condition of struma, as a deep sluggish ulceration of the cornea, with congestion of neighbouring parts, is an accompaniment of that form of the disease. But inflammation of an epiphysis may also be developed by the struma with fine connective tissues, yet such disease is more rare, more active, getting either well or worse more quickly. It is comparable to the superficial, rather ephemeral and non-congestive inflammation of the cornea, which leaves a thin but expanded nebula on the surface. Let us take our example of treatment from what we see of its effects on the eyes. The patient comes with the eyes watering and discharging a thick Meibomian secretion, holding down his head, and dreading light beyond everything. A brisk but not drastic purge with mercury is administered, and when it has acted and brought away the thick mucus that hangs about the lining of the intestine, he is able to look at the light without much difficulty, and the brunt of the disease is past. It has been my fate to see cases, that hung about for weeks, and whose treatment had been judicious, except that from want of a clear intestinal surface medicines could not be absorbed. Such a purge has been always productive of benefit, and allowed the medicines, perhaps the same as were previously useless, to have their proper effect. If, then, a child be brought to the surgeon with the early symptoms of articular osteitis, if he be gross, somewhat coarsely moulded, and have the discolorations of skin described at p. 130, he should be treated by an immediate purge containing mercury, which is to be repeated if necessary.

"This simple means, though strongly insisted upon, is not intended to be held up as a cure of early osteitis; it is the mere initiative. Much has been said against the administration of mercury in strumous disease: probably the wholesale condemnation of the medicine is intended only to apply to its use when pushed far enough to touch the gums. Let me again illustrate the applicability of the remedy by referring to strumous ophthalmia in a later stage than when it was before used as an example—when the cornea has begun to be dull in one or more spots; beginning in fact to ulcerate. I have seen treated, and formerly have myself treated such cases, with iodide of potass, cod-liver oil, iron, quinine, and other tonic and antistrumous remedies without avail; then, by the administration of a few very mild mercurials, have stopped the tendency to ulceration, or have healed ulcers already produced. In the same way as before we may apply the remedy found useful for scrofulous inflammation in one place to the same disease in another. The prescription which I generally use in this form of epiphysal inflammation is one grain, or, for strong children, two grains of gray powder, with one grain of quinine, night and morning: such a dose I continue during two, three, or even four days, then give the quinine alone at the same intervals. The mercury should never be pushed beyond a slight alterative effect, and is not to be repeated unless the skin and eyes again become muddy and thick in hue. Very many early inflammations of a joint-end in this particular constitution come under my care in the course of the year, and I have no hesitation in recommending the above mode of treatment as capable (combined of course with suitable local means) of checking the diseased action in a large number of instances.

"Strumous persons, with thin skin, clear bright complexion, and finely-cut features, are not benefited by mercury, even in slight alterative doses; neither is a purge, as above described, required so constantly, as in the coarse-conditioned struma, and such remedy must be of a non-irritating description. Cases in which a bone inflammation is developed in the delicate-formed struma are marked by a higher degree of pallor and debility than is present in any other form of commencing scrofulous disease—except, perhaps, in a rapid species of phthisis. The inflammation itself is less chronic in quality, and tends to pass more quickly into suppuration than the sluggish inflammation of the other form of strumous disease. The local treatment should be more decidedly and actively counter-irritant, but as little debilitating as possible; *e. g.*, blisters allowed to heal at once, and repeated on various parts in the neighbourhood of the disease, or the actual cautery; while all such remedies as issues or setons, that keep up a continuous and debilitating discharge, are inadmissible. Of cod-liver oil, quinine, and steel, we need not speak more especially here. Their great value in this form of strumous disease was pointed out at p. 143." (pp. 258, 260.)

His remarks upon the mechanical treatment of these affections are very precise and full. They are quite *au courant* in their minuteness of detail and in principles and practice; and although not in advance of what has been well established in this country, they bring the accepted methods of combating these formidable diseases at once within the reach of every reader, in a shape which all can easily comprehend. It would be interesting to discuss his views upon the modes of overcoming the deformity from active contraction of the muscles, or passive "contracture," such as the use of tenotomy, of immediate or gradual extension, and of the various appliances intended for these purposes. Mr. Barwell prefers the interposition of gum-elastic springs in effecting the extension and counter-extension now adopted. The following is the apparatus which he claims to have invented.

"The principle of its construction is to make a strong India-rubber spring, or accumulator, act as both extending and counter-extending force. For this purpose it is fastened by each end to a piece of catgut that plays round pulleys, attached to either end of the splint. I will describe particularly the arrangement for the knee. A long Desault's splint is furnished at its upper part with a loop of strong wire, or of steel (A), which carries a small pulley, and which projects outwards about an inch and a half. The lower part is provided with a bar running across the space of the notch, and also carrying a pulley (D). From the lower end of the splint, projecting inwards an inch or an inch and a half, is another loop, carrying a third pulley (E). A perineal band (B), passing round the upper part of the limb and splint, has a piece of rather thin catgut (violin string A or D) attached to it, which going through the upper loop of wire runs round the pulley (A), is brought down on the outside of the splint, and is attached to one end of the India-rubber accumulator (C). Round the foot and ankle are fastened two pieces of webbing (F), which lace over the instep, and to both sides of which is sewn tape, forming a loop below the sole of the foot.[1] This tape affords attachment to another piece of catgut, which plays over the pulleys, in the lower part of the splint (E and D), and is tied to the other end of the accumulator (C), with the fitting amount of tension.

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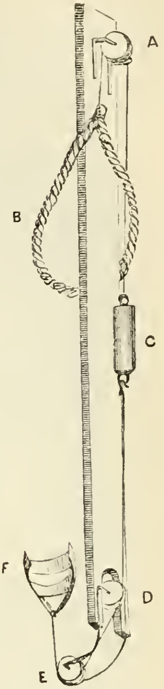
[1] "A broad well-padded leather strap going round the ankle is as good, and strapping plaster, as described in Chapter XIV , is better than either. A few little con-

"This splint may, by fitting modifications very easily applied, be adapted to any joint. It is very useful when it is desired to produce gradual extension of a joint, as of the knee; or, when properly adapted, of any other articulation. The ordinary plan of attaching a weight to the end of the foot, for extension, and fastening the patient by cords to the upper part of the bed for counter-extension, does not answer, as it produces such weariness, that no person can bear the constraint long enough to allow of much benefit. This mode of getting extension and counter-extension on the splint itself, confines nothing but the joint, and even that to as slight a degree as may be desirable; for instance, in the case of a slightly bent knee, it is not absolutely necessary to bandage the apparatus to the limb; the force of the spring keeps it sufficiently in place. It is important only that the anklet and perineal band should be duly padded and kept clean.

"Besides the mere power of straightening a bent joint (only a secondary use of the splint, and not that for which it was invented), the India-rubber spring counteracts that force, which presses the bones too violently together, thereby producing the spasm, keeping up the irritation and the caries. I have seen the most violent pains yield gradually to this contractile force: it appears, by its unvarying, constant, and yet not unyielding power, to tire out the muscles, to overcome their spasm, and to keep the joint surfaces, if not asunder, still not pressing together. It is, however, necessary that all the straps and bands be padded, and fitted with the nicest care." (pp. 268, 269.)

Fig. 16.



Our next quotation must be from the chapter on hip-joint disease. After speaking of the difficulties attendant on the study of this most embarrassing affection, and the various opinions in regard to the true seat of the disease in its commencement, he proceeds to show, conclusively, we think, that it "may begin in the synovial membrane, and in the bone, like other joint-diseases; there is no reason to suppose, nor is there the slightest proof, that it may commence in structures in which diseases of other joints do not begin, for instance, the ligaments."

"We have seen that when the subsynovial tissues, in which ligaments are placed, inflame, the ligaments themselves suffer, soften, and become thickened or absorbed as the case may tend; we have seen that internal ligaments, as the

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trivances will be found to aid in the ease with which the apparatus may be adapted. For instance, extension need not be made on the perineal strap when the splint is bandaged on the limb; but the accumulator may be fixed to the upper part of the wooden splint. There will be some tendency to ride upward, owing to the mode in which the catgut passes round the lower pulley; hence the perineal band should be fastened to the splint, and the tension on it will be very slight. (See Chapter XIV.) It will be found convenient to have the accumulator near the upper part of the splint, and to fasten to the lower catgut a piece of tape which can be readily tied and untied from the ring in the India-rubber. This being a treatise upon a special subject, the author has no right to turn to another, but he must point out the value of this extending force in fractures at the upper part of the thigh. In caries of the vertebræ some modification of it may be found useful."

crucial of the knee, which are surrounded by folds of synovial membrane, and which are in the position of a subsynovial tissue, are more apt to follow quickly in this course, than external ligaments; but the disease is not the less a synovitis, because there happen to be internal ligaments which participate early in the inflammation and become quickly changed or absorbed. How very frequently does it occur in the knee-joint, that the crucial ligaments have entirely disappeared, even in cases of subacute synovitis, where the cartilage is hardly altered, and where the general change in the synovial tissues is but slight! I have also seen the crucial ligaments all but converted into gelatinous structure, their presence being only marked by a few white ligamentous lines, running parallel to each other through the pink mass. In the same way, the ligamentum teres of the hip-joint has been found to be much softened and inflamed, while the synovial membrane around it is red and hyperæmic; but there is no possible reason for assuming that the disease begins in an inflammation of that structure more than in any other part of the synovial and subsynovial tissue. Other authors have located the diseased action in the fat which lies in the bottom of the cotyloid cavity; but this opinion is too antiquated, and too far behind the science of the present day to need serious refutation. Again, the cartilages of the hip are not differently situated to those of other joints in regard to their nutrition and diseases; they are as often, or indeed may be more often than in other joints, the seat of degeneration (p. 290); and in old subjects, in whom during life no symptom of joint disease existed, such degenerative ulcers will very frequently be found; but, except this condition, which does not produce a detectable joint disease, there is no malady of the hip commencing in the cartilage, any more than there is a malady of other joints beginning in that structure.

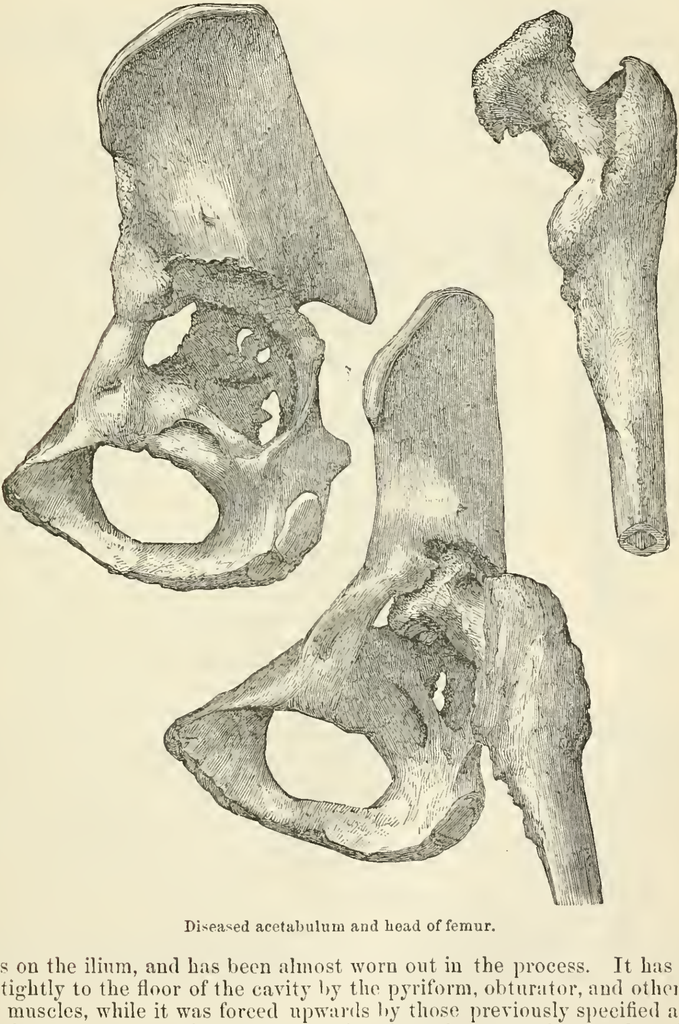
"Thus we come again to the two tissues, viz., synovial membrane and bone, whose inflammation is, as we have seen, the cause of disease in other joints; and I am sure of truth in asserting, that every hip disease commences in one or other of these parts." (pp. 297, 298.)

We cannot follow our author through this most instructive history of coxalgia. It will probably be referred to by all classes of professional readers as the most interesting if not actually the best in the book; and as such we commend its pages to those who may see this notice of it. The leading points of semeiology, pathology, and treatment are severally considered in a masterly style. The history of the different stages, the changes of shape and position, the non-reality of the apparent shortening—which he proves by a series of experiments—the causes of pain at the knee, the action of the muscles, the actual shortening, the effects of articular pressure, the rarity of spontaneous dislocation and the diagnosis of this displacement, the course and localities of abscesses and their openings, the puncture of distended capsule, the treatment by extension, and many other matters are elaborately discussed.

The only complaint we have to make is that Mr. Barwell neglects to acknowledge the claim of our countryman, Dr. March, to the merit of arousing attention to the rarity of spontaneous dislocation, to the effects of articular pressure, and to the principle of extension and counter-extension, especially with exercise, which have done so much for the treatment of coxalgia. On these points high honour unquestionably is due to the intelligence and zeal of Drs. Harris and March, and their followers, Drs. Davis, Bauer, and Sayre, of this country. Before leaving this portion of the book, let us present a beautiful illustration of a diseased acetabulum and head of femur, in which may be observed the peculiar prolongation upwards of the acetabular cavity, and the alteration in shape of the head of the femur, which were long ago pointed out by Dr. March (*Trans. Am. Med. Assoc.*, 1853, vol. vi. p. 479) as the usual effect of pressure resulting from muscular irritation, but which Mr. Barwell refers to as a peculiar influence upon the continuance of the malady which had "escaped notice."

"Let it be observed how the cavity of the acetabulum has been prolonged about an inch upwards; how the head of the femur has been altered in form; how, also, in the position which in life they last assumed, the two fit accurately together, and how the track left behind became narrower as the caput femoris wasted. It is plain from this mere physical evidence that the head of the femur was used almost like a copperplater's graver, to furrow the cotyloid cavity upwards on the ilium, and has been almost worn out in the process. It has been held tightly to the floor of the cavity by the pyriform, obturator, and other capsular muscles, while it was forced upwards by those previously specified as abnormally contracted. Thus the acetabulum is made to travel upwards and also inwards, whereby an opening through the floor of the cavity into the pelvis is not unfrequently produced, as shown by the figure. I say, that such evident yielding to the pressure upwards is not an exceptional case, but is the rule: that when we find a hip-joint ulcerating in any other way and position, it is that some rare circumstance has caused a primary osteitis in that particular spot. It must also be remarked that as the head of the femur travels upward, producing, in

Fig. 22.

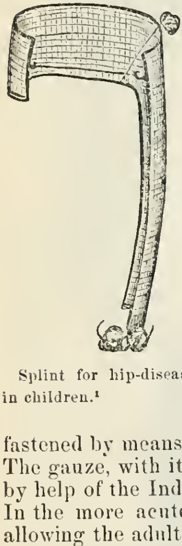


Diseased acetabulum and head of femur.

that part against which it presses so abnormally, ulcerative absorption, it causes beyond that point an additional growth of bone. forming a new lip to the new cavity (according to the law of increased growth and induration beyond the focus of a suppurative inflammation). It follows, naturally, that the change in place of the joint-cavity as in the head and neck of the femur produces a certain amount of *real* shortening, but this is slight—probably does not exceed an inch —yet adds to the difficulty in appreciating the occasional later and more violent effects of the disease." (pp. 313, 314.)

Under the head of treatment we have a figure and description of the author's splint for "the first and early stage of the disease, while there is as yet no spasm, no morbid contraction of muscles, nor any alteration, therefore, in the position of the limb."

Fig. 24.



Splint for hip-disease in children.[1]

"One portion made of wire-gauze, with a border of thicker wire, passes round the pelvis from one spine of the ilium to the other, its upper edge corresponding accurately with the crista ilii, and the whole being of such breadth, that the lower border lies immediately above the trochanter. Another portion on the diseased side runs from the end of this pelvic band down the outer aspect of the thigh beyond the knee; the two parts being immovably joined together, or cut out of the gauze in one piece. In order to secure a more lasting fit of the pelvic portion without making it too stiff, a little hook is placed at each of its ends, to which an India-rubber belt, passing across the abdomen, can be attached at a proper degree of tension. (See Fig. 24.) The angle between the pelvic and thigh portions must be such as will cause the femur to be extended on the pelvis (this will be an obtuse angle), as a flexed position gives rise in subsequent stages to certain embarrassments, which should be avoided. If the surgeon intend to apply any counter-irritants behind the trochanter, a portion may be cut away from the back of the thigh-piece, and lest this should weaken the apparatus too much, the back of the pelvic band may be connected with a lower point of the femoral portion by a piece of strong wire, or better by a piece of flat steel, so curved as to avoid the trochanter, and to fit the buttock. I have used all these forms with advantage; they keep the hip quite immovable without irksome confinement of other limbs, and if well fitted, padded, and fastened by means of a pelvis bandage, are a very comfortable form of splint. The gauze, with its edge of thicker wire, can be bent to the requisite form, and by help of the India-rubber band across the abdomen, retains a very perfect fit. In the more acute cases, it may be desirable, that means should be used for allowing the adult patient to be raised, without producing movement of the hip, so that a bed-pan may be placed beneath him. This is easily arranged, by means of a pulley fixed to the ceiling, or the upper part of the bedstead immediately above the middle of his body; through the pulley passes a rope, one end of which is attached to four cords fastened respectively to each end of the pelvic part of the splint, and to each leg by a broad band. The other end of the rope hangs within reach of the patient's hands. By pulling upon this part of the cordage the patient can lift his whole body, and the apparatus, from the bed.[2] A child too young to execute this manœuvre can be lifted so easily that no such apparatus is necessary." (pp. 321, 322.)

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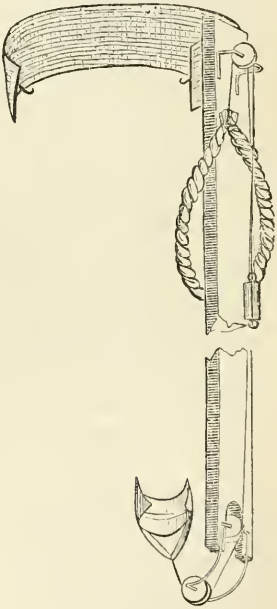
[1] "The use of pulleys at either end of the thigh-piece will be explained hereafter. For full-grown persons I find it preferable to make the thigh-piece of wood, which must be fixed by screws or other means immovably to the pelvic portion. See Fig. at p. 326. The thigh-piece is represented as broken, and a part removed to avoid giving the figure too much length. The extending apparatus and perineal band are only to be used in a later stage."

[2] "This plan is borrowed from M. Bonnet."

In speaking of the second stage, with its nightly pains and spasms and more or less change of posture, he presents us with a figure of the extension splint above and previously referred to.

"During the whole of this second stage, the deformity is due only to muscular contraction from nervous irritation, and a very slight force, if continuous, will overcome this power. The essential is to obtain a *continuous* force. All the various forms of screws, pinions, and racks are not continuous when applied to a living organism; the former are fixed, the other is moving: so that at one time the power will be intense and rigid, at another will not be exerted at all. A spring is the only force which, while it yields sufficiently to the movements and struggles against confinement, which a living part is sure to make, yet exercises a constant, never-failing traction, sure in the end to overcome muscular force, without painful rending and violent stretching of parts. Any deformity from muscular contraction[1] at the hip may be restored to the proper posture by means of the extending splint, with the pelvic wire-belt. I will not detain the reader by describing the mechanism of pulleys, straps, &c., as it has been already done (p. 268), but the method of using the splint for this particular purpose must be explained. Let us suppose the patient lying on his back, with the affected limb bent both at hip and knee. The surgeon begins by applying a broad piece of strapping on either side of the leg, from the knee to the foot, allowing an inch or an inch and a half of the material to project below the sole; he then bandages firmly to the knee. The plaster ought to be spread upon strong cloth; it is for the purpose of making extension upon the limb after the American fashion, and is much more comfortable than any other mode. It is better to leave the patient some hours before any force is exerted on the strapping, that it may establish strong adherence. When it is supposed to stick sufficiently firmly, the splint is to be placed in position; the upper portion will pass round the pelvis, the lower lie along the bed, quite out of reach of the distorted limb. The surgeon now bandages from the foot to the top of the thigh, independent of the splint; arrived at the latter place, he causes the bandage to pass round pelvis and thigh, including all the upper portion of the splint, thus fixing it with sufficient firmness. Catgut is now to be fastened to the ends of the plaster projecting below the foot; the perineal band, properly padded, is to be adapted, and both to be fastened to the accumulator with the proper degree of tension.[2]

Fig. 25.



Splint for hip-disease.

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[1] "The reader must be reminded that the word contraction in this sense only refers to an active condition: when muscles have been for some considerable time morbidly contracted, there supervenes a form of atrophy, accompanied by passive shortening and rigidity—contracture."

[2] "It is not always desirable to continue extension upon the perineal band when the patient is apt to chafe (until the deformity is overcome, the force must be thus applied); the upper end of the accumulator may then be fastened to the top of the splint. A glance at the mechanism will show that the force acts both upwards and downwards; but the lower pulley being in the situation of a movable one, causes the upward to be just double as much as the downward pressure on the splint. Hence, to prevent the apparatus riding up, it is necessary to use a perineal band, fastened to the splint, but the tension upwards will be equal to only one-

"For the first ten minutes, or quarter of an hour, the strain should be slight; the muscles soon after its application set up a startled sort of resistance, which, however, soon subsides, and then the India-rubber is to be pulled tighter. In a very few hours the foot or knee will have descended so much that a nurse, or other person in attendance, must tighten the spring, and in from eighteen to thirty hours the limb will have come down, and may be bandaged to the thigh part of the splint. This will have been effected without pain or violence; indeed, the starting pains previously complained of will even abate under the downward traction.

"If, however, the malposture be more fixed—that is, if the disease be further advanced into the second stage, the thigh cannot be thus drawn down without producing considerable pain; and in such case it will be better to give chloroform, and while the patient is under its influence, to draw down the limb into the proper position—namely, straight, and to bandage it upon the splint.

"The better to consider the treatment now to be adopted, let us glance at the condition of parts. The patient has had an inflammation in the hip-joint, and there is sufficient remaining (be it much or little) to keep up a destructive process; and at the same time he has morbid contraction of certain muscles, which under ordinary circumstances produce a deformity. We have overcome the deformity, and by bandaging can keep the limb in its place. This is the whole that M. Bonnet's, Dr. Bauer's, and all the other instruments at present used, profess to do; but, in my opinion, this is not enough. Binding the thigh to an immovable iron does not annul the contraction of muscles, but simply prevents the flexion or abduction of the thigh; the muscles still contract, and they drag the upper part of the head of the thigh-bone violently against the superior lip of the acetabulum. I have already (p. 312) pointed out that this pressure is the cause that hip-joint disease continues so long. It follows that, to enable the disease to get well, we should prevent this abnormal pressure.

"Upon this principle, our plan of treatment is simple. We have only to prevent the muscular spasm from pressing these two portions of bone together, and the disease will decrease; for in the majority of cases the pristine inflammation would be subdued by the time the second stage comes on; but that it continues in consequence of the pressure. The muscular contraction which pulls the thigh up must be met by another force which will pull it down. We cannot, nor do we wish, to separate the bones, but we can so arrange that the muscular force shall expend itself upon an external object, and leave between the head of the thigh and the acetabulum no more, perhaps rather less, than their normal amount of pressure. This can be done by the extending splint, examples of the use of which shall be given; these means will not *cure* hip-disease,[1] but they will place it in the best possible circumstances for getting well. The rest of the treatment must be adapted to the peculiarities of the case; thus, there may be tension of the capsule, evidenced by heat, considerable tenderness, and swelling behind the trochanter and at the groin, accompanied by deep-seated and confined fluctuation. A few rare cases occur whose rapid course of events would justify our including them under the head of acute synovitis of the hip, in which so much strong inflammatory fever is present that we may conclude the fluid to be synovia. By far the larger proportion of diseases in this joint belong to the subacute or chronic form; the slow succession of symptoms, and the irritable hectic-like fever, rather warrant us in assuming that the fluid in the cavity is pus.

"In the former instance, I would strongly recommend the application of the actual cautery, at the back of the trochanter, in two lines, so disposed as not to interfere with the application of the splint. A short line of cauterization at the groin, inside the femoral vein, has, in my experience, great effect in easing the pain, and also, I believe, in producing absorption of the effusion. If, on the other hand, the fluid in the joint-cavity be, judging from the symptoms, probably pus, we cannot hope to procure its absorption by such means, and any counter-

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third of the power of the accumulator.—Mr. Bigg, of Leicester Square, has undertaken to make these splints according to my pattern."

[1] "The possibility of curing a chronic inflammatory disease has been already doubted. See p. 265."

> irritation will be not only useless, but positively injurious, by adding to the pain and irritable condition of the patient.
>
> "We may, however, consider whether it will not be advisable to let out the fluid. It has been shown that, at a certain period of the disease, the capsule gives way, and the contents are poured into the surrounding parts; that a period of ease then supervenes, which is generally followed by abscess. We have, therefore, this warranty in nature for such a procedure, viz., that if we do not empty the abscess, it will evacuate itself; and by drawing out the pus by means of a canula, we prevent its diffusion among the muscles, and may even check, or very much retard, the formation of external abscess. Surgery is, I believe, indebted to Dr. Bauer for this operation, and it will, as far as my experience goes, be found very valuable. In my hands it has certainly relieved pain to a remarkable degree, and the formation of abscess has seemed, to say the least, postponed. But the more extended experience of Dr. Bauer himself will afford a more reliable account of its benefits than my smaller number of cases can furnish." (pp. 325–329.)

The apparatus of Mr. Barwell presents no especial novelty, but is easily constructed, and doubtless answers the purpose well. It is not equal in convenience and efficiency, however, to the splints of Drs. Davis, Sayre, Andrews, Taylor, and others in this country, which our author is unfortunate in not seeming to be familiar with. The absence of any account of the splint of Davis, and its modifications, and of their mode of use, is a positive defect in an American edition of the work. So much has been done by American surgeons towards the general progress in the study of the pathology and therapeutics of articular diseases, that we deeply regret in this instance the absence of the annotator whose labours it is the silly fashion now-a-days, under the lead of a few short-sighted journalists and domestic book-makers, to decry. The only reference to "American authors," except the occasional quotations from Dr. Bauer and some allusion to the resection statistics of Drs. Sayre and Kinloch, is an unjust one, which is doubly erroneous in basing its misrepresentation of the profession here on the mistaken assertion that Dr. Gross, in his *Surgery*, makes no distinction between acute and chronic osteitis. This is no very grievous wrong, and a not unnatural mistake in regard to the section misinterpreted; it is only mentioned as a curious fact, not to say illustration of the need, even to so complete a work, of a friendly word or two of explanation, in its new field of circulation, from those at least who know the ground.

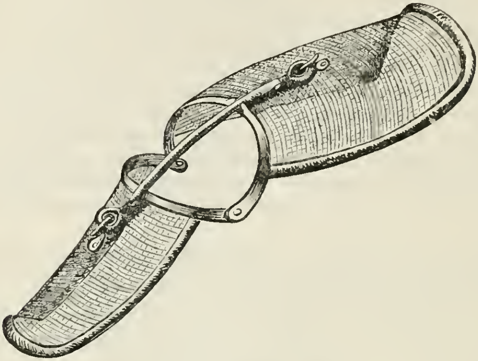
As our object has been to enable the book to show for itself, in illustration as well as letter-press, its very superior claim upon the attention of our readers, rather than to discuss its many important topics, we pass very briefly by the remaining chapters. Two of these, nevertheless, are sufficiently interesting to be worth an extended examination by themselves, and are not exceeded in importance by any of their predecessors. They are the last two, on the Restoration of Crippled Joints, and on the Removal of Diseased Joints.

As an important adjuvant in the preventive as well as restorative management of incompletely crippled joints, he recommends an ingenious splint, which is applied in front of the limb, and enables the patient to move cautiously about with crutches or a stick. This consists of a thigh-piece and a leg-piece of wire gauze, connected together at an interval by a flat band of strong steel.

> "The connecting steel portions were thus disposed: they were placed along the lower end of the thigh and the upper end of the leg-piece, and projecting beyond their edges, were riveted together so as to form a hinge at the outside and inside of the joint, in the situation of the respective lateral ligaments. The

splint in itself gives no support to the articulation; but two double hooks of an S shape are inserted into meshes of the gauze on the upper and lower portions, at such distance apart that an India-rubber accumulator can be suspended between them at a degree of tension, which may be increased or decreased as circumstances shall require by moving one of the hooks into another mesh of the gauze. The power of the India-rubber forces the joint into a straighter position, gives sufficient support, and yet allows an amount of healthy movement, and therefore gradual re-establishment of muscular strength. No bad effects have followed its use: it is only necessary that the hinge be made of steel sufficiently strong to prevent the India-rubber drawing the two portions of the splint together, and so forcing the bones to press abnormally one against the other. When the apparatus has been worn some time, I adapt to the leg a pulley and rope, whereby the patient can flex the limb passively against the power of the India-rubber springs; by pulling upon the line and then relaxing it, action of alternate extension and flexion can be produced." (p. 377.)

Fig. 26.



Splint for flexed knee.

The subjects of these last two chapters are discussed with the candid and cautious yet independent spirit, which characterizes Mr. Barwell's labours. The history of the excision of the various joints is fairly given, and the whole subject is thoroughly considered in its ordinary bearings. His statistical results, on the whole, are quite as favourable to resection as to amputation, and his verdict, although qualified and carefully expressed, with many practical cautions, is in recognition of the benefit which has already been derived, and must be looked for in the discriminating resort to these dangerous alternatives. He is in favour of resection only when, after a reasonable trial, the palliative treatment is evidently without avail. It is in this concluding chapter that we feel the want of further knowledge and experience more than elsewhere, but not through any fault of its indefatigable author; for there is not one that presents a more impartial, comprehensive, and particular exhibition of its subject in all the light that can yet be thrown upon it. Although there may be nothing new to the experienced surgeon and careful student in its summaries and precepts, it is none the less equal to the present state of the question, and affords the best view of that question, in its various important aspects, that has yet appeared in our language. E. H.

BIBLIOGRAPHICAL NOTICES.

ART. XV.—*Transactions of State Medical Societies:—*

1. *Transactions of the Medical Society of the State of New York, for the year* 1861. 8vo. pp. 408. Albany. 1861.
2. *Transactions of the Fifteenth Annual Meeting of the Ohio State Medical Society, held at Ohio White Sulphur Springs,* June 12th, 13th, and 14th, 1860. 8vo. pp. 267. Columbus, O., 1860.
3. *Medical Communications, with the Proceedings of the Sixty-Ninth Annual Convention of the Connecticut Medical Society, held at New Haven, May* 22d *and* 23d, 1861. 8vo. pp. 100. Hartford, 1861.
4. *Communications of the Rhode Island Medical Society, for the year* 1861. 8vo. pp. 66. Providence, 1861.

1. THE *Transactions of the State Medical Society of New York* open with the Annual Address of the President, Dr. DANIEL T. JONES, since deceased. The subject of the address is, the Medical Profession of the United States as it now is, and what it is destined hereafter to become: its mission, and its capacity to fulfil that mission, as shown by what it has already accomplished. With the sentiment embraced in the following remark of President Jones, we most fully concur.

"No one thing is more certain than that the science of medicine, as now taught and practised, will continue to rise above all the fallacious schemes and vagaries of a Pressnitz, a Hahneman, or a Mesmer. Its march will be steadily onward; the sound, educated common sense of mankind, that faculty which the politicians term the sober second thought, will weigh and try all those questions, and we have nothing to fear in a contest between enlightened and experimental science, and a blind experimenting faith."

The first scientific paper is on *traumatic tetanus*, by Dr. J. MCNULTY, of the city of New York. The position assumed and defended in this paper is that, in the blood of certain persons, there circulates a morbific principle. which produces in them a *tetanic diathesis*, which, when sufficiently developed, and then only, will give rise to tetanus, whether the patient shall receive or not any local injury. Dr. McNulty disclaims the ability to demonstrate the morbific cause of tetanus, or to show in what manner it operates to produce the result; these points he reserves for future investigation.

The chief argument in favour of the position referred to. is the unquestionable fact, that tetanus has occurred idiopathically without the infliction of any injury whatever, while, on the other hand. the very class of injuries, the infliction of which is reputed to be those most apt to occasion tetanus, occur daily, in a very large number of cases, and under all the conditions which are usually esteemed as those increasing their tendency to give rise to tetanus, without any tetanic symptoms being produced.

That there is in certain individuals a constitutional tendency to the occurrence of tetanus cannot, we believe, be denied; upon close investigation, however, it will be found, we feel persuaded. that this tetanic diathesis is dependent upon a peculiar condition—a morbid state possibly of the nervous system. We can see very little evidence of its being the result of a special tetanic poison circulating in the blood.

The second paper is on *the use of mercurials in acute pericarditis*, by Dr. S. OAKLEY VANDERPOEL, of Albany. The author denies that mercurials, given with a view to their specific effects we presume is meant, have any control over the march of the disease, or in the prevention of exudation; on the contrary, he believes them to be always injurious in consequence of the debility they produce.

This applies, however, only to the acute stage; the utility of mercurials in the chronic stage of pericarditis, when the system is relieved from the more immediate depressing elements of the rheumatic poison, the impoverished blood, or the exhaustive fever, Dr. V. does not call in question. The clinical experience of every one, he admits, proves that it quickens the absorption of any serous exudation, which may have passed to this stage.

The third paper is on *dermic medication*, by Daniel P. Bissel, of Utica. The dermic administration of remedies is not advocated by Dr. B. in preference to the usual plan of medication whenever this is practicable or successful. He confines it mainly to cases in which we are compelled to abandon the giving of medicines by the mouth, where often we are enabled by it to relieve troublesome symptoms, sometimes even to effect a cure in cases which without it must necessarily have terminated fatally. The endermic method of medication is no doubt often overlooked under circumstances where it is emphatically our only therapeutical resource.

The next paper presents the *statistics of suicide* in the city of New York for the years 1859 and 1860. It is by Dr. J. G. Adams, of New York city.

In 1859 the suicides amounted to 56—33 males, 23 females; being in ratio to the total mortality as 1 to 386; to the entire population, as 1 to 14.285. The individuals *found drowned* amounted to 165, of which 16 were females, and 56 foreigners. Two-thirds of these were probably suicides. There were 10 deaths from *unknown causes*, some of which may be reasonably attributed to suicide.

The 56 known suicides took place—11 cases in September; 8 in November; 12 in March and April, 6 in each month; in February and August, each 5 cases; in June 4 cases; in July and December, each 3 cases; in October and May, each 2 cases; in January, 1 case.

The highest mortality during 1859 occurred in the month of August, the lowest in May.

The ages of the suicides were as follows:—

Between 15 and 20 years . .	3 cases	Between 40 and 50 years . .	16 cases
“ 20 “ 25 “ . .	6 “	“ 50 “ 60 “ . .	5 “
“ 25 “ 30 “ . .	8 “	“ 70 “ 80 “ . .	1 case
“ 30 “ 40 “ . .	12 “	Of unknown age . .	4 cases

Few cases occurred among women of the town, and none among a coloured population of about 10,000.

In 1860 there were 62 suicides reported—45 males, 17 females; being in ratio to the total mortality as 1 to 366, and to the entire population as 1 to 13,000. A ratio that has been found to vary little from year to year. The number found drowned was 40, two-thirds being probably suicides. Deaths from unknown causes amounted to 42; some of these no doubt being suicides.

The known suicides occurred—7 cases during each of the months of August, January, and June; 6 cases during each of the months of November, March, and May; 5 cases during each of the months of September and December; 4 cases during July; 3 cases during each of the months of February and April; and 2 cases during October.

As in 1859, the greatest number of suicides were among those in middle life, between 30 and 40 years of age. The youngest case was in an individual between 10 and 15 years old; the oldest between 60 and 70.

One-fourth of the cases were in those of native birth; one-fourth were Germans; another fourth, Irish; and the remainder of different European nations.

During the two years in 76 cases only is the mode of suicide reported, namely, in 36 cases by poisoning; by hanging in 20 cases; by shooting in 12 cases; by cutting throat in 5 cases; by drowning in 3 cases.

For poisoning the most common agents employed were laudanum and white oxide of arsenic; after these, oxalic acid, stramonium, Scheele's green, and cyanide of potassium. The suicides by shooting were mostly males; by hanging and laudanum were the most common forms of suicide among females.

On *bleeding in cerebral disease* is the subject of the next paper. It is by Dr. S. Oakley Vanderpoel, of Albany. The circumstances which, according to Dr. V., forbid a resort to the lancet in diseases of the brain are, when the patient, comatose and paralyzed, is cold and collapsed; when the action of the heart is feeble and intermittent; when there is present a state of anæmia; when the patient is of a very advanced age; if there exist evidence of extensive disease of the arterial system; if there was good reason to believe that already a large amount of hemorrhage had taken place within the cranium.

If, however, he remarks, the patient is of vigorous frame of body, if the face be flushed, the attack recent, and the pulse strong and full; particularly if it follows the sudden suppression of some accustomed hemorrhage, moderate bleeding is beneficial. The amount to be determined by its effects on the heart's action: the object being not to draw away blood from the brain, but to diminish pressure on that organ by lessening the force with which the heart propels the blood through the carotid and vertebral arteries. If too profuse, it will increase the irritability of the heart, while at the same time the blood is impoverished, thus actually favouring the condition it is sought to remedy.

The views advanced by Dr. V. in the paper before us appear to be, in the main, perfectly sound. His therapeutical conclusions do not strike us as differing very materially from those now generally recognized by our best practitioners.

The two next papers are on *Diphtheria*. The one by Dr. U. Potter, of Hallsville, the other by Dr. F. Jacobs, of Delaware, N. Y.

The first gentleman writes, that in his neighbourhood, within a circle of a mile or more in diameter, few persons, whether young or old, failed to exhibit more or less traces of the prevailing epidemic influence. The term diphtheria, however, was restricted to such as exhibited the characteristic exudation in the throat, whether in the form of isolated patches or of an extended membraniform coating.

According to Dr. Jacobs, the disease, as observed in Delaware Co., N. Y., was far more fatal on the higher grounds than in the lower valleys.

A case of *poisoning by corrosive sublimate* in which death ensued within forty hours, is reported by Dr. H. S. Downs, of New York. Upon examination of the body, the stomach was found to contain some four ounces of a grayish-black viscid fluid. Near the base of its anterior wall, at the cardiac extremity, was a patch nearly two-thirds of the size of the palm of the hand, of a bluish-black colour, resembling gangrene. A similar patch of the size of a quarter dollar, existed at the pyloric extremity, though less marked in disorganization. Five smaller patches, from two to four lines in diameter, intervened. There was one patch of reddened mucous membrane of the size of a silver dollar; the residue was of a grayish hue. The mucous coat was softened, but, excepting at the two larger points of black discoloration, was not broken. The intestines contained only a small quantity of a greenish pulp; the mucous coat seemed destroyed. Externally they had a slightly injected appearance, and felt gluey to the touch. The liver was fatty and congested. Nothing abnormal was detected in the other viscera of the abdomen, nor in those of the thorax. Brain not examined.

The next is the history, by Dr. J. G. Orton, of a case of *suspected poisoning*. Upon examination of the exhumed body of the deceased, forty-two days after death, extensive general decomposition of portions of the body having taken place, nothing of a very decided morbid character was detected, excepting that throughout, especially in its parenchymatous structure, the liver was studded with an immense number of minute crystals consisting for the most part of cholesterine, fat-globules, and hippuric acid.

Upon a chemical examination of the contents and tissues of the stomach and intestines, the former presented no trace of the presence of any mineral poison, while in every portion of the latter was detected the positive presence of corrosive sublimate, and, it was believed, in quantity sufficient to account for the remarkable state of preservation in which those tissues were found at the date of the *post-mortem* examination.

Two days previously to the death of the patient, a homœopath, it was proved, had administered to her a solution of corrosive sublimate every three hours. The strength of the solution was not ascertained.

The verdict of the jury was, that the deceased came to her death from causes to them unknown.

An interesting *case of suicide*, caused by the plunging of a shoemaker's knife into the right side of the throat, with such force as, after driving its point into the substance of the fifth cervical vertebra, to break the instrument off within an inch of its point, is related by Dr. T. C. FINNEL, of St. Vincent's Hospital.

This case is one which shows the great necessity of caution in deciding whether a wound inflicted in any given case is the result of a suicidal or homicidal intent. The position of the wound on the right side of the neck, its direction, and the violence evidently used, would, at first view, lead to the suspicion that the deceased had been murdered, but the circumstances of the case did not permit of any such conclusion.

A very interesting *case* of *compound, comminuted,* and *complicated fracture of the upper end of the tibia*, is related by Dr. ALDEN MARCH, of Albany. The fracture in this case was caused by the bursting of the driving-wheel of a threshing-machine, and besides its compound and comminuted character, it was complicated with an injury of the anterior tibial artery giving rise to considerable hemorrhage at the time of the accident, and at intervals subsequently, and the injection of a large mass of blood beneath the integuments, causing a circumscribed swelling some four inches below the knee, on the outside of the leg. Amputation was performed on the sixty-third day after the occurrence of the fracture, and was followed on the ninth day afterwards by death.

The case and its result bring up the question of the proper treatment of compound fractures; the rules in relation to which are very concisely summed up by Dr. M. Considering all the features of the case in question, he comes to the conclusion, that in similar ones, and under similar circumstances, provided a clear diagnosis can be made out, early amputation is the correct practice—the one which affords the only chance of saving the patient's life.

The next paper, by Dr. J. C. HUTCHINSON, of Long Island College Hospital, is the history of a case of *fracture of the spine*, caused by a fall, in which exsection of portions of the eighth, ninth, and tenth dorsal vertebræ was performed: with a tabular summary of twenty cases, in which the same operation was effected.

"A feature worthy of note in the above case," remarks Dr. H., "was the extent of the injury to the vertebræ and spinal cord, of which we were of necessity ignorant before the operation: and this suggests, in a very small compass, the leading arguments against it, viz: 1. We cannot, *in any case*, know the amount of injury which the vertebræ have sustained; whether there is a fracture of the processes, or of the bodies. 2. We are also ignorant of the extent of the mischief which has been inflicted on the cord, whether it be compressed, or lacerated, or divided; consequently, the operation may be inadmissible, on account of the state of the bones of the cord. If the case presented any features which would satisfy the surgeon that the fracture of the bone was limited to the arch, or that the cord was sound, or, if there was any reasonable probability that such was the case, I suppose the operation would be justifiable, but this state of the question decides it in the negative, except, perhaps, in such as Nos. 8, 9, and 10 of the table, where the patients survived the immediate effects of the injury, and were operated on several months or years subsequently."

The fourteenth paper is the account of an *instrument for the dilatation of stricture of urethra*, by Dr. BURGE, of King's County. The instrument is a metallic cylinder of the size of the largest bougie, containing within it a series of cylinders representing bougies of a gradually diminishing series. Carrying the instrument as far up into the urethra as can be done without difficulty, the next in size is to be protruded, and so on, gradually, from the larger to the smaller inclosed cylinders, each being always retained in place, as a guide to the next. The mucous membrane being thus kept sufficiently stretched, to prevent any folds of it forming to prevent the passage of the instrument, there is nothing to contend against except the stricture itself.

The next paper is on the best place for *amputation of the lower extremity, with reference to the adaptation of an artificial limb.* The author, Dr. DOUGLAS BLY, of Rochester, suggests "that in those cases in which the flexors of the foot cannot be saved, the junction of the middle and lower third of the tibia," is the lowest part at which amputation of the leg can be performed, so as to give sufficient room for the adaptation of a good and graceful artificial substitute, with a well-constructed ankle-joint, leaving a stump of sufficient length to be serviceable to the patient. To this point, the surgeon, in amputating, should keep as near as circumstances will permit. If the entire leg, below the knee, has to be sacrificed, the amputation Dr. B. recommends to be performed just above the condyles of the femur, or as near to this part as possible, but never through the knee-joint, the size of the condyles interfering with the construction of, while it renders clumsy the artificial knee-joint.

The 16th paper is on *the treatment of fractures of long bones by simple extension without splints*. It is by Dr. J. S. SWINBURNE, of Albany. The plan proposed by Dr. S. is to place the patient in bed, and then pass a broad, well padded belt beneath the perineum and over the groin on the same side with the injured limb, in such a manner that the line of counter-extension made by it shall be through the long axis of the femur. This perineal belt is secured to the head of the bedstead. Extension is obtained by the application of adhesive strips, from half an inch in width, and sufficiently long to be applied along the outside of the leg, descend spirally, and protrude so as to form a strong loop beneath the sole of the foot, and then ascend upon the inside of the leg. These may be secured by strips or a roller bandage encircling the limb. A strong cord is to be passed through the loop of adhesive strips and secured to the foot of the bedstead. The advantages of this plan of treating fractures of the lower extremities are that it is far more comfortable to the patient, and allows him greater freedom of motion without endangering a displacement of the fractured bone. It enables the seat of fracture to be always readily examined, and in cases of compound fracture, gives free access to the wound of the muscles and integuments. It enables the length of the limb to be ascertained whenever desired, and the amount of extension required to be regulated with comparatively little trouble. It does not interfere with the circulation in the limb, and obviates the occurrence of sloughing at the heel or malleolus. It prevents agglutination of the muscles to the bone or to each other, and the consequent stiffening of the limb, and leaves the muscles in a condition for locomotion so soon as this is admissible. There is no difficulty with this plan of maintaining reduction and apposition of the fractured ends of bone; the chances of distortion or shortening being diminished; no case of non-union of the femur has occurred under its use. To prevent eversion or inversion of the foot, a bag of sand or bran may be applied on either side of the foot, or a strip of plaster or cloth made use of.

By the above method forty cases have been treated; twelve hospital, twenty-eight private. Of the latter, twelve were intracapsular. Fifteen cases of fracture of the femur treated by simple extension compare very favourably with those treated with splints.

The application of this plan of treatment to other fractures appears to have been found equally advantageous and successful. For the evidence in support of this, and for the modifications necessary in the character and application of the counter-extending and extending means according to the nature and seat of the fracture, we must refer to the paper of Dr. S., which will afford ample compensation for the time demanded for its careful study.

A case is related by Dr. T. GAILLARD THOMAS, of *recovery from suspended animation after chloroform*, by the use of Dr. Marshall Hall's ready method, after the lapse of twenty minutes from the period of the complete suspension of animation. After the action of the heart had recommenced, the galvanic battery was employed. But Dr. T. is convinced that the recovery was entirely due to Marshall Hall's method, the other means having only aided this in the accomplishment of the result.

Dr. A. VAN DYCK, of Oswego, relates a rather singular case of complete *inversion of the uterus*. The process of inversion was undoubtedly commenced at the delivery of the placenta by an unskilful midwife: undue force being exerted upon the funis to drag away the after-birth before active contraction of the uterus had commenced. The partial inversion then produced, gradually progressed, until, on the eighth day after confinement, a little straining at stool rendered the inversion complete. The suffering of the patient abated after the third day. This Dr. V. thinks can only be accounted for on the supposition, that, at the period named, the uterus had so far descended into the vagina as to cause a remission in the previous spasmodic contractions of the organ. The reduction of the uterus in this case was effected readily by the usual manipulations. The patient suffered little or no inconvenience subsequently.

In the next paper is given, by Dr. C. V. BARNETT, a case of *rupture of the womb complicated with strangulated umbilical hernia* in a state of gangrene. The evidence of ruptured uterus was undoubted. To give the infant a chance for life, gastrotomy was instituted immediately upon the death of the mother. On removing the covering from the abdomen, an enormous umbilical hernia was discovered, its investments being absolutely black in consequence of the gangrenous condition of its contents. Upon opening the abdominal cavity the infant was found, all but the head and arms being without the uterus, in contact with the posterior surfaces of the abdomen. It was dead. The rent in the uterus was strictly longitudinal. In other respects the organ was healthy. The placenta was still adherent; no material hemorrhage had occurred.

The twentieth paper gives the history of a very interesting case of *polypus uteri.* It is by Dr. G. A. DAYTON, of Mexico, N. Y.

The next paper is on *rupture of the uterus*, with an account of three cases; by G. J. FISHER, of Sing-Sing. The cases described by Dr. Fisher occurred all in strong, healthy, respectable Irish women. The children were all males of large size, weighing from ten to twelve pounds. The presentation was natural in all. No premonitory symptoms gave warning of the approaching accident. The laceration occurred on the right side, involving in all the cases both uterus and vagina. In all the placenta had escaped into the peritoneal cavity, and the uterus was firmly contracted. No great positive hemorrhage occurred. One case was unattended by nausea or vomiting, or by recession of the child's head. In all, the outlines of the child could be traced with remarkable distinctness through the walls of the abdomen, serving as the most distinctive and characteristic symptoms.

In two of the cases delivery was effected by the forceps, and in one by craniotomy. All three cases terminated fatally to both mother and child.

From the result of these cases, taken in conjunction with the statistics of Dr. Trask, Dr. F. has come to the determination, should he be so unfortunate as to witness other cases of rupture of uterus, to resort without delay to the abdominal section, unless delivery could be otherwise accomplished promptly and without the slightest difficulty. He believes that in nearly every case it would increase the chances of recovery, unless, perhaps, where the vital powers are in a state of extreme prostration.

An interesting case of *sub-peritoneo-pelvic pregnancy* is related by Dr. JULIUS A. SKILTON, of Troy. After death, in this case, a ruptured tumour containing a fœtus, cord, and placenta, was found lying between the folds of the peritoneum and external to its cavity, beyond and below the ovary, and not in the Fallopian tube. The placenta was attached to the posterior fold of the peritoneum, and this being a serous membrane, its bloodvessels could not conjoin readily with those of the placenta, and, as a consequence, the growth of the fœtus was nearly suppressed. Absorption of that portion of the peritoneum to which the placenta was attached, resulted in rupture and fatal hemorrhage. A caducous membrane was found protruding from the os uteri. The fimbriated extremity of the right Fallopian tube was transformed into a sac which contained a small quantity of sanious fluid.

A *case* is reported in which the patient, a young married female between 22 and 23 years of age, was delivered consecutively *of twins, the second pair within one year and five days after the first.* The first pair of twins died within a few days of each other, when four weeks old. Soon after her first menstruation, fourteen months subsequent to the birth of the second pair of twins, the patient was attacked with intense peritoneal inflammation, and died on the ninth day of the disease. The case is related by Dr. Charles Burrows, of Clinton.

The twenty-fourth paper is the history, by Dr. R. J. HEMSTREET, of an *encysted* *tumour of pelvic origin.* The case was an extremely obscure one. The presence of the tumour was not positively made out until after the death of the patient. She had complained for several years of a series of symptoms all pointing to some difficulty, probably the presence of a tumour, in the pelvis. Ascites was finally developed, for which she was tapped and six quarts of water drawn off, soon after which she died.

On opening the abdomen after death, the peritoneum was found thickened, an empty cyst was discovered from which the fluid had been removed by tapping; above this was another empty cyst, from which probably had escaped the fluid discharged through the puncture made by the trocar on the day she died. Occupying the hypogastric and pelvic regions was a tumour, originating low down in the pelvis, to the sides of which it was firmly attached. The apex of the tumour pressed forward the posterior walls of the vagina. The condition of the uterus was nearly healthy, excepting that it was thrown by the tumour upwards and outwards above the pubis. The urinary bladder was so compressed that its cavity was nearly destroyed. The tumour was composed of a congeries of cysts, from the size of a large pea to that of a goose egg, filled with a gelatinous fluid. On opening one of the cysts, it was found to inclose another smaller one, while it was probable this latter contained another still smaller.

A very remarkable *case of suppression of urine* is related by A. G. PURDY, of Madison County. The physicians, nurses, parents, and neighbours of the patient, a maiden lady, 36 years of age, all concur in the statement that, for nearly six years, the patient had laboured under complete suppression of urine. Previously to the complete suppression, the patient was obliged to use a catheter, at first daily, then at longer and longer intervals, at last of a month or two. The urine was described as dark and thick like the sediment of coffee. The face of the patient, originally fair, is now black, with the exception of the upper lip, and from the corners of the mouth downwards. The left arm and leg are also black. The discoloured skin appears as if covered with a thin coating of dry black blood. The covering of her face is not continuous but fissured, giving the resemblance of scales which touch without overlapping, and having considerable lustre. The change of colour commenced on the left hand, about the time the use of the catheter was discontinued. Occasionally, small quantities of blood ooze through the skin. A former physician of the patient states that he has seen her expectorate, during a paroxysm of coughing, a substance strongly resembling charcoal. Her parents say that for eight weeks she had not had an evacuation from her bowels.

The *report of the Committee on Medical Education* follows next in order. The report is replete with sound practical views. It condemns the proposition so earnestly maintained of the importance of a preliminary degree, licensing to practise, but subordinate to that of doctor of medicine. As the most essential means for elevating the standard of excellence in the candidates for admission into the medical profession, the report insists upon the necessity: 1st. Of a more thorough preliminary education before entering upon the studies of the profession. 2d. A longer and more thorough, by which is not meant merely a more extended, course of instruction in our medical schools; and, 3d. A more thorough and severe ordeal for the final examination to admit to the doctorate.

The next report is that of a special committee appointed to devise some *means of controlling the use of adulterated and inefficient medicines.* The plan suggested is for physicians to make themselves practically familiar with the physical and chemical tests of genuineness in the articles of the materia medica and pharmacopœia prescribed by them, and to make the cost of medicines, simple or compounded, always subordinate to quality.

A *report* follows, *from the delegation of* the New York State Medical Society *to* the fourth decennial *National Convention for revising the United States Pharmacopœia*, and then a report on *medical topography and systematic drainage.* The latter, with its several appendices, is a paper replete with interest, although its general details and conclusions all apply primarily to the geographical and topographical aspect of the State of New York. Still the leading practical truths embraced in it may be made available in the pursuit of a similar series of inquiries in respect to the medical topography and systematic drainage of any other State. We cannot, however, afford the space a proper analysis of the report would demand.

A short *report* succeeds *from the committee on medical and surgical statistics.* It is, if we understand it, an explanation of the delay which has occurred in the presentation of the statistics for the past year deducible from the registrations of the practice of the individual physicians of the State.

The next report embraces a memorial relative to *the medical profession and its legal protection;* following which, are short *biographical* notices of recently deceased members of the Society; *A system of medical ethics* adopted by the State Medical Society of New York; the *Code of the American Medical Association;* and an Abstract of *the proceedings of the State Society,* at its fifty-fourth annual session; *list of members*, etc.

Preceding the list of members is an account, by Dr. J. MARION SIMS, of the city of New York, of an *amputation of the cervix uteri*, which was received too late to allow of its insertion elsewhere. The operation proposed by Dr. S. is to cut off by means of a scissors as much of the cervix uteri as is deemed advisable, then, by passing four sutures of silver wire through the anterior and posterior borders of the wound thus made and drawing them tight, to bring these borders or wounded edges into apposition in a straight line across the middle of the stump, so as to cover it completely, but leaving a small central opening for the os, just over the outlet of the cervical canal. The advantages of this plan are said to be the facility and rapidity with which the parts heal by the first intention, avoiding the danger of pyæmia, of degeneration of tissue, or of the stump contracting as it heals. In the three cases in which the operation has been performed by Dr. S. there was no hemorrhage requiring a ligature: after the operation menstruation was easy, though in each case the os was smaller than natural and required to be enlarged by slight incisions.

2. The session of the Ohio State Medical Society was opened by an address from the President, Dr. L. FIRESTONE, of Wooster; the subject of which is the office of the physician, together with the leading mission to be accomplished by our State and national medical associations. It is a sensible production, but presents no points beyond those which constitute the usual staple of similar addresses.

Following the address of Dr. Firestone is the report of the *Committee on Obstetrics*, drawn up by Dr. M. B. WRIGHT, of Cincinnati.

The report is an able one, while its contents are of a somewhat miscellaneous character. A case is related to prove that the presence of the hymen is no barrier to impregnation. Other instances are recited with the design of showing that sexual intercourse may take place while the female is asleep, or in an unconscious state—a circumstance which might become of some importance in a medico-legal point of view if it could be proved. A few cursory remarks in denunciation of the fearfully increasing practice of criminal abortion are made. Cases are related to show that abortion is a more frequent consequence of mental impressions than is generally supposed. Connected with this subject, facts are also adduced leading to the conclusion that the embryo may lose its vitality, while the placenta continues to increase considerably in size, and remain an indefinite period within the uterus, with a destruction of its natural functions. This fact, if established, must necessarily modify somewhat our treatment of threatened abortion. In the cases related in the report before us, the signs of pregnancy disappeared after having become prominent, and it was found, after the ovum was expelled, that its death must have occurred previously to the disappearance of those signs. The query then presents itself, whether it would not be judicious in those cases in which the distinct signs of pregnancy had disappeared to avoid the use of means calculated to prevent uterine action, and even to resort to such safe measures as are within our reach to facilitate the expulsion of the blighted ovum. The retention of a blighted ovum may not, it is true, be absolutely dangerous; it is, however, an inconvenience which the patient should not be permitted to incur.

The subject next touched upon in the report is the delivery of the placenta—the well being of the uterus demanding that it should, if possible, be thrown off by the tonic contractions of the organ, to secure which should be the object of the practitioner as soon as the child is fully delivered and properly attended to.

Some remarks are made in reference to the extreme mobility of the uterus in its normal condition, in reference to the pathology of prolapsus and ante or retro-version. The morbid feelings which are usually described as being the result of prolapsus, Dr. W. is of opinion, are not, in fact, caused by mere change of position in the uterus, but arise from congestion or inflammation with morbid sensitiveness of the neck or body of the organ, whatever may be the position of the latter. Consequently, it is not to measures adapted to replace and retain in its position the dislocated uterus, our attention should be directed, but to correct the morbid condition, the congestion, inflammation, and abnormal sensitiveness of the organ, or perhaps, in some cases, of the vagina, bladder, or urethra.

"If careful and extended observation in future should be made, it will be found, we think," remarks Dr. W., "that the uterus did not duly contract after labour, and that this was mainly the cause of trouble. If this be true, the removal of the placenta before the uterus has made several ineffectual efforts to detach and expel it, is unsafe practice, and all the usual means should be carefully employed to secure a permanent tonic contraction of the uterus." "Upon examining cases, in which not only the general symptoms of prolapsus were present, but a soft and tumid uterus, we have applied tincture of iodine two or three times a week to the neck of the organ, and as it became condensed and less in volume, all symptoms of prolapsus have vanished."

Some remarks are made on the subjects of ruptured uterus, and the Cæsarean section. The latter operation, instead of turning, is advocated by Dr. W. in cases of rupture of the uterus, with escape of the fœtus into the abdominal cavity. Even in cases of rupture of the uterus with impacted head of the fœtus, where craniotomy is necessary to effect delivery, he believes that the Cæsarean section will be warranted in most instances, and afford a reasonable chance of recovery to the mother, when without, she must inevitably perish.

The report closes with a defence of the author's mode of effecting cephalic version from the adverse criticism of Professor Miller, in his recent work on obstetrics, showing its feasibility, the end to be effected by it, and the cases to which it is adapted.

The next report is on *cannabis indica* as a therapeutic agent, by Dr. R. R. M'Meens, of Sandusky. The diseases in which it has been recommended by different authorities, European as well as American, are tetanus, neuralgia, uterine hemorrhage; to increase uterine action in cases of labour, where ecbolic remedies are indicated: dysmenorrhœa; some forms of leucorrhœa; puerperal convulsions; chorea, delirium tremens, mania, shaking palsy, hooping and other spasmodic coughs; infantile convulsions, and the purely nervous affections generally. A number of cases are collected from various sources to show its efficacy in acute rheumatism, gastrodynia, spasmodic asthma, gonorrhœa, hysterical insanity, laryngismus stridulus, nervous rheumatism, chronic bronchitis, tetanus, etc. etc.

The report embodies a very valuable body of facts bearing upon the therapeutic uses of cannabis indica, and which establish its character as a valuable calmant, hypnotic, and anodyne in a very large circle of diseases. We must look, however, to future more extended and varied observations to determine the precise character of the cases, and the period of each in which its beneficial operation is the most certainly to be obtained, and the doses and combinations in which, under particular circumstances, it is best administered—with the conditions, if there be any, which contra-indicate its use.

The report on *Medical Literature*, by Dr. E. B. Stevens, of Cincinnati, presents a very general though sufficiently fair notice of the more recent additions to the medical literature of our country, and of the character and extent of its current professional periodical literature. The latter constitutes, confessedly, the especial instructor of the great body of physicians throughout our country—it being the medium through which the onward movement of the different departments of the healing art are first and most extensively made known to them. Its importance to the working members of the profession, and the influence which it is adapted to exercise upon medical opinion and practice, press it strongly upon the attention of all who have the interests of the profession at heart, and demand that it should be constantly subjected to a cautious supervisorship on the part of our State and national associations.

The next paper in the Transactions is on the *effects of chloroform* upon the intellectual processes, being an inquiry concerning the credibility of testimony relating to transactions of a mind partly conscious. After a very extended inquiry into the capacity of the mind, when rendered partly unconscious either by a condition of imperfect sleep, or by any other cause, to recognize and distinguish the transactions which actually occur during that condition, so that it may bear accurate testimony in respect to them, from a metaphysical and physiological point of view, Dr. WRIGHT proceeds to examine into the condition of the intellect during certain stages of anæsthesia, produced by chloroform. The entire paper is marked by a high degree of interest. The inquiry to which it is devoted is conducted with great ability, and the premises and deductions of the author bear, with few exceptions, the unquestionable impress of truth. His general conclusions, for which alone we have room, are as follows; they appear to us to be in accordance with all the facts bearing directly upon the subject, which have been collected up to the present time.

"1st. That the will is always active while there is mental consciousness.

"2d. That the will cannot be directly impressed by another will, but that the judgment may be misled, and the will, though free, may act upon false conceptions, in a manner different from what it would do if the mind and senses were perfectly active.

"3d. There may be venereal connection with a female while she is conscious and unwilling; but there may be no venereal connection with a female, while she may honestly believe there has been, from her having been under the delusion of organic sensibilities, occasioned by the peculiar action of chloroform upon her nervous sensibilities.

"4th. It is impossible for a woman very often to decide whether actual connection has been had or not.

"5th. The evidence of a person respecting transactions that occur to the mind while partly conscious, is always liable to the most monstrous fallacies, and it should not be received as sufficient proof of any fact.

"6th. Evidence of females respecting rape upon themselves, while unconscious from chloroform, is particularly liable to suspicion.

"7th. Evidence of females respecting rape under such circumstances, should be subjected to all the rules and exceptions of circumstantial evidence, and should be fully corroborated by other circumstances."

A report of *the Committee on Obituaries* is next in order. It is drawn up by Dr. C. P. LANGDON, of Westerville, and comprises a short biographical sketch of Dr. H. A. Ackley, a recently departed physician of Ohio.

The report of the *Committee on Diseases of the Eye*, by Dr. A. METZ, of Massillon, after a short consideration of the condition of ophthalmic surgery in the United States, proceeds to give a sketch, and a very good one, of the symptomatology and treatment of purulent ophthalmia, and one of the most common terminations of the disease in its chronic form, granular conjunctiva. The report sets forth in a very concise manner the present state of our knowledge on the subject, but without the addition of any new observations in illustration or correction of received views, and modes of treatment.

The consideration of the deep-seated diseases of the eye commences with a notice of the ophthalmoscope and its uses. The diseases briefly noticed are cataract, and the operations for its removal; the morbid conditions of the iris and their surgical management; the nature and treatment of glaucoma. A very good *resumé* of recent observations, and teaching and practices, in respect to these ophthalmic diseases, is given by Dr. Metz, but nothing new.

A report is made by Dr. W. H. REEVES, of three cases of inflammatory disease of the neck of the uterus, treated with the local contact of nitrate of silver, by the reporter.

The next report is on the *condition of the medical societies of Ohio*, with a reply to a preamble and resolutions of the Toledo Medical Association, asking for the adoption of measures adapted to "procure legal protection to the medical profession;" by Dr. G. F. Mitchell, of Mansfield.

The Committee admit the necessity of legal protection, to secure to the people of the State the services of well informed and thoroughly educated medical men, and to prevent the injury to individuals and to society which results from the encroachment upon the profession, properly and legally constituted, of uninformed and incompetent individuals; the Committee are, at the same time, of opinion that it is impossible to attain this important end, at present, through legislative enactment, and that the remedy for the evils under which the profession labours is within the reach of the profession itself.

It is very certain that from our legislatures the medical profession can look for little aid: it is very much to be feared, that the inefficient and half way legal protection it would be inclined to mete out to it, and the almost insuperable difficulties that would be thrown in the way of its successful execution, would rather become, in the end, a premium for charlatanry, than a remedy for evils which now exist in respect to the proper practice of medicine in our midst.

The concluding report is on *insanity.* It is by Dr. R. Gundry, assistant physician to the Southern Ohio Lunatic Asylum, at Dayton. It is a very ably drawn-up paper, and furnishes a truthful summary of the more prominent questions connected with the etiology and management of that disturbed condition of the intellectual, moral, or instinctive faculties of the mind which constitutes insanity. From an examination of the most reliable statistics, Dr. G. indicates the ratio of insanity to the general population in various cities and countries, showing that the disease is most rife in the principal seats of civilization, and increases constantly with the progress of civilization. Propositions, the truth of which will admit, we think, of some dispute.

His investigation is next directed to the influence of seasons and climate on the production of insanity. The seasons range in respect to their efficiency in the production of the disease as follows; first summer, then spring, then autumn, and lastly winter.

In respect to the period of life at which insanity is most prevalent; from a great variety of statistics, Dr. G. concludes, that the greatest *absolute* number of cases occur between 20 and 30 years of age, while by comparing the occurring cases of insanity with the proportion existing in the community at the same ages a slightly increased proportion will accrue between the ages of 30 and 40—or that mankind at that age are brought into contact with more causes of insanity than at any other. The ages when the fewest cases of insanity occur are under 20 and over 60 years.

In regard to the influence of the several civic conditions, the statistics of insanity furnish insufficient data for the establishment of any very positive conclusions.

The next department of the report is devoted to a general consideration of the Causes of Insanity. From the reports of seventeen hospitals in the United States, Dr. G. has carefully classified the causes there assigned for the production of insanity in 22,815 cases—from which are excluded such in which "hereditary transmission" is assigned as the sole cause. Of the foregoing cases, he finds that rather more than four-sevenths, 44.72 per cent., are ascribed to *physical* causes, and something less than three-sevenths, 32.82 per cent., to *moral* causes, while in some 22.44 per cent. of the cases the cause was unascertained. Among the males over three-fifths, 47.09 per cent., of the cases in which the cause was ascertained, are referred to *physical* causes, and less than two-fifths, 29.05 per cent., to *moral* causes; while among the females, three-fifths, 48.62 per cent., of the cases are ascribed to *physical*, and two-fifths, 31.88 per cent., to *moral* causes; in 19.47 per cent. the cause was unascertained.

We are unable to follow Dr. G. in his remarks on the special causes included in each of the two general classes of physical and moral.

The report concludes with a general view of the curability of insanity.

3. The subjects of the annual address delivered before the sixty-ninth annual convention of the Connecticut Medical Society, by the president, Dr. Ashbel Woodward, are Life, its characteristics as exhibited in the vital organism of man; the causes by which the degeneracy of that organism from its assumed

normal standard has been brought about; and the possibility and means of its renovation. It is a well conceived and ably written address, that may be read with profit: it presents for our notice, however, no very striking or novel propositions. The address is followed by an annual dissertation, having for its subject *hereditary predisposition;* it was read by Dr. JOHN B. LEWIS, of Rockville. The views of Dr. L. in reference to hereditary predisposition to disease are characterized by sound common sense, and are in conformity with the best authenticated facts in reference to the etiology of those classes of disease which are known to prevail in particular families, generation after generation. The means by which this hereditary tendency may be exterminated presents a subject for the investigation of medical men of vast importance; in it is involved the successful prophylaxis of some of the most serious of the maladies to which the human subject is liable—maladies, more than one of which have heretofore set at naught every plan of treatment that has been devised for the arrest of its fatal career.

We have next an interesting sanitary report from Hartford County, drawn up by Dr. L. S. WILCOX. By it we learn that during the year 1860 the whole number of deaths in the county was 1,530—males, 769, females, 750; sex not given, 11. Of these deaths 304 occurred in infants under 1 year of age; in those over 1 and under 5 years, 296; in children between 5 and 10, 96; in individuals from 10 to 20, 80; from 20 to 30, 139; from 30 to 40, 113; from 40 to 50, 87; from 50 to 60, 112; from 60 to 70, 98; from 70 to 80, 109; from 80 to 90, 57; from 90 to 100, 12. In 27 cases the age is not given.

The deaths by classification were—from zymotic diseases, 431; diseases of the respiratory organs, 346; of the nervous organs, 202; of the digestive, 66; circulatory, 33; generative, 16; urinary, 10; locomotive, 9; integumentary, 1; diseases of uncertain seat, 147; old age, 57; violence, 81; stillborn, 40; unknown, 91.

Percentage of deaths to the entire population of the county, 1.69.

In 1860 the deaths exceeded those of 1859 by 199. The excess was chiefly in the zymotic diseases; those of uncertain seat, and of the nervous and respiratory organs. The excess in zymotic diseases is 106, of those of the respiratory organs, 46. This large increase of deaths from these classes of diseases was probably due, it is stated, 1st to the unusually damp meteorological condition of the last year, the towns of greater mortality being those especially exposed, both in respect to soil and situation, to moisture and high winds; 2d. The prevalence of an epidemic influence in some parts of the county, manifesting itself especially in the occurrence of diphtheria. The number of deaths by the latter disease was 74; they nearly all occurred along the course and in the vicinity of the Farmington River. The first notice of the disease in the mortuary bills of the county was in 1859.

Some circumstances are referred to that would seem to indicate a low average of vitality and viability in the female as compared with the male, during the period of life from 5 to 45 years.

"The average mortality of females under 5 years stands for the past five years in ratio to that of males, at 100 to 116.8; but from this age on to 45, every decennial period brings in a larger mortality for the female than for the male. This unexpected result—omitting the process by figures—is contrary to the accepted expression of extended mortuary reports, and is so far confirmatory of the indication already suggested.

"The ratio of births for the past five years stands at 100 for females to 114.04 for males. Now, most physiologists give as forces determining the sex of the new being, these two prominent ones, viz.: greater relative age, and greater relative vitality.

"Hofacker in Germany, by a rigid application of this rule in regard to age, found the ratio of births to stand at 100 females to 103.4 males, where the age of the father was from one to six years greater than that of the mother. Sadler obtained also nearly the same result in Britain. By comprehensive averages of the whole of Europe, the births were as 100 females to 106 males, where the preponderance of age on the side of the husband is undoubtedly greater than from one to six years. Now the assertion may be safely ventured that in this county the relative age of the husband does not preponderate more than from one to six years, which, on the results already stated, would suggest an anticipation, in the births, of a ratio standing at 100 females to 114.04 males, forcing the conclusion upon us that if these data are reliable, the vitality of the mother here is very low compared with that of the European mother; and both results point to the inference already drawn, viz.: that in this county the relative vitality of the male from 5 to 45 is greater than that of the female. This result, of however doubtful derivation, chimes in with the painful apprehensions of anxious observers of public health."

The remainder of the Transactions consist of a number of biographical notices of recently deceased physicians of Connecticut, including those of Drs. William Tully and Wm. S. Pierson, the one born in 1785 and the other in 1787. The first of these gentlemen was confessedly among the most learned and scientific physicians of New England. The *Materia Medica* of Dr. Tully, though incomplete, is nevertheless a monument to his industry, learning, and ability; and, even although the reader may not be able to yield assent to all the theoretical and practical views inculcated by its author, he cannot refuse to acknowledge the genius and skill manifested by him in the preparation of this work, his profound knowledge of his subject, and the importance of his labours for its illustration and advancement.

Dr. Pierson was chiefly distinguished as an obstetrician; his knowledge, skill, and experience, united to his happy faculty of inspiring his patients with confidence in his ability to carry them safely through their confinements, rendered him justly celebrated in this department of medicine.

4. The first of the communications made to the Rhode Island Medical Society at its session of December, 1860, is an address *on the relations of the young physician to the profession and the public*, by Dr. H. G. Stickney, of Providence. The address is marked throughout by good sense. It sketches in bold outline the trials and temptations, the pleasures and rewards to be expected by the young practitioner of medicine during the first years of his professional career, with a side glance at the popular medical epidemics by which he will be encountered and his onward progress perhaps impeded.

The second communication is in the form of a letter *on some points of military surgery*, addressed to Professor Frank H. Hamilton, of Brooklyn, N. Y., by Dr. Usher Parsons, of Providence R. I. The points discussed in the letter are the importance of free ventilation to the well being and ultimate recovery of the wounded in battle, and the propriety of the delay of severe surgical operations until the system of the patients has entirely recovered from the shock of the injury.

In respect to amputation for tetanus, the experience of Dr. Parsons is decidedly against it. He has amputated twice without any benefit. He has seen no case of successful treatment when the disease has developed itself. For the prevention, after a battle, of traumatic tetanus, he considers it of great importance to graduate the covering or clothing of the wounded in accordance with the temperature of the air—hot days succeeded by cool nights having been found the most productive cause of tetanus.

The third communication, from Dr. W. Owen Brown, of Providence, is the history of *cases of phagedenic ulceration treated by the external application of chlorate of potassa*, and of *scrofulous ophthalmia treated by the local application of tincture of iodine.*

The cases treated by chlorate of potash were one of phagedenic ulceration, of a most unpromising character; and one of severe phagedenic vulvitis: both terminated favourably. In conjunction with the chlorate as a wash, there were given internally quinia, iron, and other tonics, together with a generous diet. It was only, however, after the free application of the chlorate, that a rapid arrest of the ulceration took place.

Three cases of scrofulous ophthalmia were successfully treated by applying the officinal tincture of iodine, with a camel's hair pencil, over the outer surface of the upper and lower eyelids, some three or four times at intervals of a few days.

The fourth communication is the history of a case of *tubercle of the lungs resulting in pneumothorax* and death, by Dr. T. K. Newhall, of North Scituate.

The next paper is an account, by Dr. J. H. ELDREDGE, of East Greenwich, of a case of *interrupted and renewed lactation.* A lady, one month after her delivery, in consequence of a severe attack of disease, was obliged to wean her infant; at the end of six weeks it was again applied to the breast, and in the course of a fortnight the secretion was fully restored, and furnished sufficient nourishment for the child during the ordinary period of suckling.

The concluding communication is on *the epizoöty lately prevailing among swine*, by Dr. E. M. SNOW, of Providence. This confessedly is a subject of deep importance, whether we take into consideration its bearing upon questions of a strictly pecuniary character affecting the interests of our farmers and pork-dealers; upon those appertaining to hygiene; or upon those connected with general pathology, arising out of the recognized relationship between epizoötic maladies and epidemic diseases affecting the human subject. The contribution made by Dr. Snow towards the elucidation of the nature of the epizoöt which, in many parts of our country, has prevailed so extensively among swine, is deeply interesting, especially his history of the results of numerous dissections of the diseased animals. Dr. S. believes it to be a general blood disease, of which the pleuro-pneumonia, the diarrhœa, the intestinal ulcerations, the purpuric spots, the ulcers about the mouth, feet, and other parts are the local effects.

Appended to Dr. S.'s paper is an account of a case of pleuro-pneumonia in the cow, by Dr. Collins. A disease which Dr. S. believes will be found to be identical with the epizoöt which forms the subject of his address. D. F. C.

ART. XVI.—*Report on the Influence of Alcoholic Drinks on the Development and Progress of Pulmonary Tuberculosis.* By N. S. DAVIS, M. D. (*Transactions of the American Medical Association*, vol. xiii., 1860, p. 565.)

PROF. DAVIS commences his report by stating that within the last eight years the idea has been circulated through the various periodicals of the country, that alcoholic beverages are capable of preventing the development of pulmonary tuberculosis, and of retarding its progress after it has been developed. He states that this idea not being in consonance with many facts that had previously come under his observation, he was led to commence a record of all the well-marked cases of tuberculosis which came under his observation, in relation to the use of alcoholic beverages. He has recorded two hundred and ten cases. "The leading object in recording all these cases was to ascertain just how far the subjects of them had been under the influence of alcoholic drinks for a period of not less than one year previous to any active or noticeable symptoms of the tuberculous disease." Analyzing his cases in pursuance of this object, he finds that of the 210 cases 68 had used some form of alcoholic beverage almost daily from one to twelve years previous to the active signs of tuberculosis; 91 had used these drinks occasionally; and 51 had wholly abstained from their use. Of the 68 persons who were habitual drinkers, only 15 were drunkards. Of the 91 who drank occasionally, some were accustomed at times to indulge to an excess, and others drank very sparingly and only on some social occasion.

The author concludes from these results: "It is clearly demonstrated that the use of alcoholic beverages, however uniform their administration, and however long continued, neither prevents the development of tubercular phthisis, nor retards the rapidity of its progress."

The subject is one of interest, and not without practical importance. It is not, however, to be confounded with another subject, viz., the value of alcohol as a remedial agent in phthisis. As the author remarks, "It by no means follows that if these beverages are shown to be useless as prophylactics, they are therefore equally useless as remedies." Still it must be admitted, if it be true that the habitual use of alcoholic drinks affords no protection against the development of phthisis, the fact is an argument of considerable weight against the probability of their remedial value. It is desirable, then, to inquire whether the statistical results given in the report by Prof. Davis warrant the conclusions which he draws from them. We propose to raise this inquiry.

Let us see, in the first place, whether Prof. Davis has presented all the postulates involved in the problem which he undertakes to solve. To determine the influence of alcoholic drinks on the development of phthisis, it is not enough to ascertain that a certain proportion of patients affected with this disease has been addicted to the use of these drinks. No one will assert that the use of alcoholic drinks affords an infallible protection against the disease. The question is, whether they who habitually use these drinks are rendered thereby less liable to this disease than they would otherwise be. Now, it is ascertained that a certain proportion of a given number of patients affected with phthisis have been accustomed to use alcoholic drinks. This is one point in the problem. Another essential point is to ascertain whether this proportion falls below or exceeds the proportion of those who, in like manner, have used these drinks out of an equal number of non-tuberculous persons in similar conditions of life. It is plain that we must have some standard of comparison by which to judge whether the proportion of drinkers among patients affected with phthisis be so large as to show no antagonizing influence of alcoholic drinks, or so small as to lead to an opposite conclusion. Prof. Davis appears not to have considered the importance of this in assuming that the results of the analysis of his cases leads to the conclusion which he draws from them. In fact, the statistical results of his analysis constitute but a preliminary step to the inquiry concerning the influence of alcoholic drinks on the development of pulmonary tuberculosis. Having obtained these results, the next point to be settled is, whether they show among tuberculous patients a large or a small ratio of those who are addicted to the use of alcoholic drinks. How is this point to be settled? Plainly, the only way is to ascertain the ratio among patients not tuberculous, from the same classes of society of those who are equally addicted to the use of alcoholic drinks, and then institute a comparison of the results of the two analyses. Whether the results of Prof. Davis's analysis prove the influence of alcoholic drinks to be favourable to the development of phthisis, or otherwise, is thus, as we conceive, a problem to be settled by facts to which Prof. Davis makes no reference. In the absence of these facts, we have as much right to assume that the statistics given by Prof. Davis prove the prophylactic influence of alcoholic drinks, as he has to assume an opposite conclusion. Without assuming the former, we believe it will be found to be true.

The cases recorded by Prof. Davis occurred in hospital and private practice. He does not state the proportion of hospital cases, but we infer that they constitute the large majority, from the fact that, of the 210 cases, in all but sixty the patients were foreigners, and the author indeed gives, as an explanation of the large number of patients from Ireland (85), the fact of his being brought into connection with this class in the Mercy Hospital of Chicago. We will suppose all the 210 cases to have been hospital cases. In 51 of these 210 cases the patients had wholly abstained from the use of alcoholic drinks. This is certainly a large proportion of persons practising total abstinence to be found among the classes of patients received into a charity hospital. Would there be found 51 persons who had practised total abstinence for years among 210 hospital patients not affected with tuberculosis? But of the remaining 159 cases, in 91 the patients only used alcoholic drinks occasionally, some very sparingly and only on festive occasions. Now, it is absurd to suppose that an occasional indulgence, whether sparingly or in excess, is of any appreciable account in determining the influence of alcoholic drinks on the development of phthisis. These cases are to be excluded. So far as any influence is to be attributed to alcoholic drinks, the class of cases only is to be considered in which the persons "had used some form of alcoholic beverage almost daily from one to twelve years previous to the active signs of tuberculosis." To this class belong 68 of the 210 cases, or a fraction over 32 per cent. Now, is this a large or a small percentage? This question is to be answered after ascertaining the percentage of a similar class, as regards the use of alcoholic drinks, in 210 hospital cases not tuberculous. We are not in a situation, at the present moment, to appeal to facts, but we shall be surprised if they do not show a larger percentage; if so, assuming that Prof. Davis's cases were mostly hospital cases, his statistics will clearly prove the reverse of the inference which he deduces from them. Taking the statistics as they stand, we may reason *for* a prophylactic influence of alcoholic drinks precisely as Prof. Davis does *against* such an influence, and, as we conceive, with greater force. Prof. Davis's argument is, so large a proportion as 68 of 210 tuberculous patients being habitual drinkers, it is proved that alcoholic drinks exert no influence to prevent phthisis. *Per contra*, it may be said, so large a proportion as 142 of 210 tuberculous patients not being habitual drinkers, it is proved that alcoholic drinks do exert a positive influence in preventing phthisis.

With regard to the value of alcohol as a remedy in pulmonary tuberculosis, Prof. Davis admits that an apparent improvement may be produced by it, but he says, "Truth compels me to say that I have never seen a case in which this apparent improvement was permanent." Inasmuch, however, as he states that the idea of alcoholic beverages preventing the development and retarding the progress of this disease when it was announced, was not in accordance with his views, and he began to collect cases in disproval of this idea as long ago as 1855, it is fair to presume that he has not employed alcohol in the treatment of this disease to much extent. We confess ourselves to be among those who have been led by clinical observation to attach no small value to alcoholic beverages in the treatment of phthisis. We are certainly able to cite a number of cases in which we have seen not merely a temporary, but a permanent improvement under their use, in conjunction with hygienic influences. But we reserve the consideration of this subject for some other occasion.

In concluding this notice, we would say a word or two with reference to statistical researches in medical investigations. Admitting their incalculable value, they are as likely to contribute to error as to truth, if it be not constantly borne in mind that the results of statistics lead to correct conclusions only by means of logical methods of reasoning. Facts in themselves accurate may be made subservient to error by regarding them from a limited point of view, or by false logic. It would not be difficult to find instances in which statistical facts have been adduced as the basis of certain conclusions, when a critical examination showed that such conclusions are not legitimate, if indeed they are not precisely the opposite of those which are to be legitimately deduced from the facts. Erroneous conclusions based on statistics are apt to remain long undiscovered, for most persons are not fond of looking into the statistical details, but accept the conclusions, presuming that they are logically deduced. These considerations afford a sufficient apology for our critical notice of the paper by Prof. Davis, if any apology be needed beyond the importance of the subject. If we have erred in our criticism, we shall be glad to be corrected.

With regard to the influence of alcoholic beverages in the prevention and treatment of phthisis, we insist that, as a purely medical subject, it be separated entirely from its incidental relations to other subjects. To speak more plainly, as a medical subject it is not to be mixed up with matters pertaining to temperance. In saying this, we mean no disrespect to or disparagement of the latter subject. Far from this, we hold the subject of temperance to be one of vast importance to the physical and moral welfare of mankind. All that we mean to say is, the subject of temperance is one thing, and the influence of alcohol on disease is another subject; and to secure a proper investigation of the latter, the two subjects should be kept distinct. Limiting our attention to pulmonary tuberculosis, when we have ascertained the nature and extent of the influence of alcohol in this disease, assuming that it does exert a favourable influence, then it becomes a highly important question, how far is the use of alcohol as a prophylactic or remedial agent in this disease objectionable on the score of favouring intemperance? For one, we have no disposition to ignore or to undervalue this question, but we claim that it should not be involved in the study of therapeutics so as to bias the mind in pursuing clinical researches; and, moreover, we claim, in behalf of those who deem it their duty to advise alcoholic beverages in the treatment of phthisis, exemption from the imputation of being unfriendly to the cause of temperance. A. F.

ART. XVII.—*Proceedings of the American Pharmaceutical Association, at the Ninth Annual Meeting, held in the city of New York, September,* 1860, *with the Constitution and Roll of Members.* Philadelphia: 1860.

THE Proceedings of this interesting and important Association, although not constituting so bulky a volume as that of the preceding year, are calculated to attract the attention not only of pharmaceutists but of physicians, who are equally concerned in the progress of pharmacological knowledge. From the statements made by members, it appears that the meeting of the Association, from which these Proceedings were derived, was as harmonious and earnest as on former occasions, and was even more numerously attended, contributing to the private gratification of the members as well as being productive of utility to themselves and to the public. We propose to present a summary of these Proceedings, with such remarks as may appear relevant to the subjects as they are presented to us.

The opening chapter is in the form of a prefatory note from the Executive Committee, which contains, among other things pertaining to their office as publishers, the recommendation to authors of papers to write in such a way as to facilitate the work of the editors, a circumstance which is apt to be overlooked by those not accustomed to write for the press. The two points most usually neglected, and strenuously insisted on, are the correct spelling of proper names, and legibility. A recommendation would also have been in place to write on but one side of a sheet, for which observance printers are most grateful, as it vastly facilitates their operations. In the report of the committee, which is the first paper of importance that follows, the committee has the melancholy duty to announce the death, during the year, of no less than seven prominent fellow members.

In the annual address, the President (Mr. Samuel M. Colcord, of Boston) speaks thus:—

"It gives me pleasure to congratulate you upon the very prosperous condition in which we commence the ninth year of our labours. Our rapidly increasing numbers, and the amount, variety, and quality of talent now at our disposal, and continually augmenting, gives promise of a bright and hopeful future, of a development commenced that shall place pharmacy with the foremost in the sanitary reforms of the day, performing an active part in removing that stigma from medicine produced by systematic overdosing—of which homœopathy and the prevailing medical infidelity is a counterpoise, and which, like the services of counter-irritants, having performed their uses, should be abandoned."

This would seem to be a happy hit, and will do well for a merely pharmaceutical mind, but it overlooks the fact of the progressive character of medicine itself, and a want of knowledge of the labours of the great medical minds who have lived within the last thirty years. Broussais' principles and practice did more towards breaking up the administration of large doses of medicinal agents than the introduction of infinitesimal medicine. True improvement in the art of prescribing has kept pace with the advances in pathological and therapeutical knowledge, aided by the presentation of better pharmaceutical preparations which the science of pharmacy has given to medical men. These afford the reason of improved and more satisfactory treatment of disease.

There are some other matters in this address, which we may casually mention. It appears that the subject of a charter has been agitated. With reference to this, the President states that "in fact the present sphere of our operations does not seem to require a charter." The difficulty, as in all similar associations, lies in the universality of the association. A local charter would make it a State institution, and thus break up the general and widely diffused interest that attaches to a society belonging to the whole country. We do not see, in the present condition of things, that, with all its advantages, an identity could be brought about with the British Pharmaceutical Association. Education, which is one of the objects thrown out as worthy of encouragement, in our humble opinion will be better encouraged, not by organizing "a learned faculty on a uniform national basis," but by the systematic recommendation and patronage of the competent local schools, which have done such good work in placing pharmacy where it now stands. Reference is made to the *Pharmacopœia*, with the recommendation for its exclusive adoption and support. The sale of poisons and the Sunday trade are alluded to. The latter has been the subject of discussion for some time. The difficulty in closing the shops of dispensing apothecaries arises from the exigencies of the sick, and the corresponding demands for medicines on the part of prescribers. Sickness occurs on every day of the week; the physician in his visits of relief has no Sabbath day. He cannot crowd his work into a few early hours, and in carrying out his mission must have the assistance of his fellow labourer, the apothecary, in our large cities. If it be meritorious to lift an ox or an ass out of a pit on the Sabbath day, can it be desecrative to administer relief to God's image? This, however, does not apply to the general trade of the apothecary and druggist, which should be confined to the limits of other occupations. There is a common sense view of this matter which should be carried out in every establishment, and when so done will relieve both the master and apprentices from inordinate duties. The address throughout is marked for its soundness, deep interest in the science of pharmacy, and decision of opinion which characterizes its author.

Upon looking through the minutes, it will be perceived that many topics of importance occupied the attention of the association, and were fully discussed. Among others, the question of legislative interference in the sale of poisons, was fully entered upon. This is of the utmost consequence to the community, and we are glad to find that the whole subject has been referred to a committee to mature a report and present it to the next meeting. The Legislatures of several States have passed laws to regulate the sale of poisonous substances, but they are complained of as defective. The reason lies in their having been drawn up hastily, and without the full requisite information on the part of their framers. It is to be expected, then, that the enlightened action of this committee will hereafter result in the right and effective legislation by our rulers.

The first report of committees is that on the Progress of Pharmacy. It is divided into several parts, as—the condition and number of the schools and societies, necrology, pharmaceutical literature, the drug market, materia medica, pharmacy, inorganic chemistry, organic chemistry, toxicology, sale of poisons, &c. This report is eminently faithful, and must have cost its author, Mr. Edward Parrish, much labour and research. It may be pronounced an admirable summary, extremely valuable from its extent and fulness.

The next report is on Home Adulterations. At the commencement it is remarked that, "Your committee feel deeply the responsibility of their duty; they feel that much ought to be said and done which they dare not take the responsibility, as individuals, of saying and doing. They trust the time will come when State Legislatures, or the general government, will cause such penalties to be affixed to the selling of adulterated articles, that the business will cease to 'pay,' and that 'honesty' will be practised because it is the best policy. During the past year, your committee have had many articles of drugs, medicines, and food submitted to their examination, and they have felt more and more the necessity of some means being devised for checking this abominable practice, which, in the language of another, is undermining the very foundation of trade, viz., faith in commercial integrity." The reasons presented for practising adulteration are given as follows: *First*, for the purpose of making the substance more saleable, by improving its appearance by the addition of some body either innocuous or otherwise. *Second*, to depreciate the quality by adding some substance which will diminish the *real* without altering the apparent strength or general appearance. This is generally a very deadly fraud. *Third*, to depreciate the quality and 'extend' the quantity, by the addition of some simple substance, as water, or, if a solid body, as sand, gypsum, &c."

In this connection the use of lead pipe for the introduction of water is commented upon, and the remark is made that, "it is a question upon which scientific men have differed." The question resolves itself into one of pure science, depending upon the nature of the water thus carried. If water is charged with such salts as our Schuylkill water, the prevention of any evil consequences results from their behaviour on the interior surface of the leaden pipes, protection is afforded by their presence, and reactions occur whereby a protective coating is formed. We have never known or heard of a case of lead disease traceable to the water of Philadelphia, but this is not so elsewhere, and the subject is therefore one of hygienic interest. As the report is from the pen of a Boston gentleman, (we presume,) whose name stands at the head of the committee, and from the citation of cases, the warning is well made for impression in all districts where danger may be lurking, and especially is this the case in the rural districts where the purest water is to be found, uncontaminated with calcareous or magnesian salines. The report also contains some interesting information on the subjects of milk, bread, and wine. opium, nitrate of silver, and chloroform.

The special reports are upon the following matters: Oleum æthereum, citric acid, sulphate of ammonia, emplastrum assafœtidæ, atropia from American grown belladonna, production of alcohol in the United States, aloin, paraffin, carrageen, production of conium seeds in the United States, guaiac, Smyrna opium, hops and lupulin, patent medicines, camphor, garlic, coca, and cacao. It is impossible for us to go into an analysis of the investigations that have been entered into on these items. It will be sufficient to intimate that they have been handled by the most intelligent and industrious pharmaceutists of the country, and are of decided importance as additions to our knowledge.

The volume of Proceedings closes with a number of volunteer reports and essays. The first consists of Remarks on Manufacturing Pharmacy, by Mr. Faber, of New York, which has some practical suggestions. The next is on Dice's Liverpool Hydrometer, by Dr. Wilson H. Pile, of Philadelphia. It is drawn up with his accustomed accuracy and painstaking. With reference to this gentleman of so much unpretending worth, it may be without impropriety stated that he has placed the medical as well as manufacturing community under deep obligations, by bringing the instruments for determining the gravity of fluids to a state of perfection and accuracy, before not attainable without great care, and dependence on a foreign source, with attendant expense. His gravimeters, as we know from our own experience, are the most accurate in the market.

An essay on hydrobromic acid and on bene culture will be found worth perusing. The former is from the pen of our friend John B. Maisch, of Philadelphia, who is doing good service to his adopted country by giving it the benefit of his German thorough, scientific, and analytical training. The sketch of the life of Cavendish is a good epitome of Wilson's life of the great chemist and philosopher, published by the Cavendish Society some years ago. The appendix contains a list of plants imported by the Patent Office, the Constitution of the American Pharmaceutical Association, and the roll of members.

The contents of this volume certainly exhibit the fact that the pharmaceutical profession are deeply in earnest in their endeavours to promote the advancement of their profession, and that the spirit of scientific research has been fully awakened in the United States. It is to be regretted, however, that the laudable efforts of which we have presented the manifestation, have received a check from the disturbed condition of the country. and that the preparations made for the meeting of this year have been held back for a more opportune occasion. The meeting of the Association was to have been held in St. Louis. A brighter day must come, and then scientific pursuits can, under auspicious circumstances, assume their wonted channels. J. C.

ART. XVIII.—*Transactions of the Obstetrical Society of London. Vol.* II. *For the year* 1860. *With a List of Officers, Fellows, etc.* London, 1861. 8vo. pp. 368.

THE Obstetrical Society of London, the Transactions of the third year of whose existence are recorded in the volume before us, has proved, thus far, a most successful organization. Among its three hundred and fifty fellows are included a large number of obstetricians, who by their talents, their industry, and their faithfulness, are fully qualified to carry out the important objects had in view in its organization; of busy practitioners, willing and able to cultivate fully their respective fields of observation, and with a zeal and method which cannot fail to develop principles and practical results calculated to enlarge, improve, and confirm the science and the art of midwifery.

The contents of the first volume of the Society's Transactions gave an earnest of the value of its future labours; an earnest which has been fully redeemed by the contents of the volume which now demands our attention.

This volume comprises, besides an anniversary address by the President of the Society, Dr. Edward Rigby, *thirty-four* articles. Of these twenty-one are histories of obstetrical cases of more or less importance; seven are devoted to an examination of questions of considerable interest in the department of practical midwifery; two describe cases of monstrosity in the fœtus; the remaining papers are devoted to a history of midwifery in the East; to an examination as to the power and act of propagation among the industrial classes of London, and to an account of a case of sloughing from reckless vaccination.

We shall endeavour to give as full an account of these articles as is in our power without being tedious.

The President of the Society, in his anniversary address, delivered January 4, 1859, makes mention of a movement on the part of the body having for its object a revision of the existing regulations of the several examining and licensing bodies of London as respects the medical education of obstetrical students, which regulations in their present state are pronounced to be "insufficient for insuring such an amount of proficiency as this important branch of the healing art not only deserves, but requires—the quantum of knowledge in midwifery being far inferior to what is demanded in the sister branches of medicine and surgery." The address contains, besides, short biographical sketches of three of the deceased fellows of the Society, Drs. Lever and Griffith, and Mr. Squibb. The first died on the 29th of December, 1858, the second June 23d, 1858, and the third in the month of January, 1858.

The first paper is the history of "*an intra-uterine fibro-plastic tumour*, removed by enucleation;" by Dr. J. Hall Davis. The patient was 51 years old; had menstruated regularly up to June, 1859. The flow was always large, but unattended with pain in the back or other suffering. For nine years had had much leucorrhœal discharge, sometimes purulent, and occasionally flooding. Had suffered for ten years from a gnawing sensation at the hypogastrium, and experiences much inconvenience in the pelvic region when riding in a carriage; and from frequent inability to void her urine has repeatedly to introduce a catheter. The urine is of a light amber colour, non-albuminous, and otherwise healthy in appearance. The patient was rather above the medium height, her habits were very active, and she spent much of her time in her garden. Had never suspected the existence of any uterine malady; had never undergone a vaginal examination. Palpation of the abdomen (September 29, 1859) showed the bladder to be so distended as to reach midway between the umbilicus and pubes. Between two and three pints of urine were drawn off. A hard circumscribed body was now detected extending symmetrically above the pubes, supposed to be the distended uterus; which diagnosis was confirmed by an examination per vaginam. By this it was found that the uterus was enlarged, and its neck obliterated, in consequence of the development of the organ for the accommodation of a growing tumour. The orifice of the uterus was open to the size of half a crown; within it was felt a roundish, smooth tumour, adherent to the inner surface of the uterus anteriorly, and on the right side down to the margin of the orifice; on the left side the adhesion extended to within an inch of the orifice, while posteriorly the tumour was entirely free up to the fundus of the uterus, to which it extended. A few days later an attack of flooding occurred, after recovery from which the patient went to her home in Devonshire. She returned to London about the 25th of October and placed herself under the care of Dr. Davis. Soon afterwards another flooding occurred, which, however, entirely ceased before the end of the month.

On the 1st of November, by introducing his finger through and within the reflection of mucous membrane, passing from the cervix to the inferior surface of the tumour, Dr. Davis made the attempt to enucleate the latter from below upwards. Beginning in front, he detached the tumour up to a line beyond which he could proceed no further. Latterly he was able to proceed with the detachment somewhat higher up. Dr. D. believed that at least half if not two-thirds of the tumour was now detached. He desisted from any further attempt, fearing to do mischief in consequence of the firmness of the remaining attachment. There was very little hemorrhage during or after the operation. The uterus was washed out with warm water. The patient passed a good night, without pain.

Next day Dr. D. attempted to remove at once the detached portion of the tumour by the application of the écraseur, while the patient was under the influence of chloroform. Upon trial, however, it was found impossible to adjust the instrument. A whipcord ligature was, in consequence, carried around the tumour at the upper limit of its detached portion.

Things went on very well until the 5th of November, when symptoms occurred which though not in themselves of a particularly alarming character, were nevertheless sufficient to make Dr. D. anxious about the patient and desirous to get rid of the tumour as quickly as possible, from a fear of the occurrence of pyæmia from the absorption of putrescent matters produced by the dead portion of the tumour. The canula and ligature being removed, and the uterus and vagina well washed out with a solution of permanganate of potash, two drachms to a pint and a half of water, a pair of Museaux's forceps were guided upon the index finger in a direction to get a firm purchase upon the lower part of the tumour. By means of the forceps the tumour was gradually drawn down so that the part below the ligature, which was putrid, flaccid, and very compressible, passed into the vagina. Small portions broke away from time to time, upon which a firmer hold was taken higher up. Proceeding with the tractions and cutting off some portions, the putrid portion of the tumour, about two-thirds of the entire mass, was brought through the os externum, and a glimpse obtained of the parts above the ligature. During the operation firm pressure was applied above the pubes. The uterus, uninverted, was brought lower into the pelvis, and after the larger part of the tumour appeared externally, the organ had undergone some contraction of its muscular fibres and reduction of its bulk. By proceeding with the traction, getting continually a fresh hold higher up, and, finally, by a combination of traction with a twisting of the tumour close to its remaining adhesion, it was removed entire from its connection with the uterus. The operation lasted nearly half an hour. There was scarcely any hemorrhage. The uterus was now again washed out with the same solution as before, and some port wine diluted with water was given, as had been done during the operation. Opium by the mouth always disagreeing with the patient, none was given, but a poultice of linseed meal with the addition of laudanum was applied to the hypogastric and sacral regions, where some pain was complained of. Under a very simple treatment the case did very well.

At the end of a fortnight from the application of the ligature, Dr. D. writes, my patient was able to take a drive, and at the end of three weeks she was well enough to return home.

"The operation of the ligature on the tumour had the effect of facilitating my subsequent proceedings in its removal, and appeared, by weakening its adhesion, at first so firm as to resist all prudent efforts to break it down, to make the final separation a matter of no great difficulty.

"On examination the upper part of the tumour presented a perfectly fresh appearance; below this was the groove of ulceration formed by the ligature, beneath which was the putrescent portion."

The tumour was submitted for examination to Dr. Jenner.

"On microscopic examination, he found it to be composed of fibrous tissue, with a very large intermixture of fusiform nucleated cells, but no cells of the kind supposed to indicate a malignant character. It therefore belonged to the order of fibro-plastic tumours of Lebert. Its outer covering was composed of cellular tissue, with fine vessels. The lower part was covered by a reflection of mucous membrane. The mass required to be soaked in many waters before it parted with its contained blood; hence it must be inferred that it was highly vascular, a point in which it differed from ordinary fibrous tumours."

We have next the account, with the drawing of "a large *congenital encephaloid tumour* not impeding delivery," by Mr. Spencer Wells. The tumour was of an ovoid form and considerable size, projecting downwards from the surface of the chin and left side of the face. The infant lived three weeks after birth.

The tumour, upon examination, proved to be an encysted mass of encephaloid matter, separated by dissepiments into imperfect cysts or areolar spaces, chiefly attached to the lower jaw and the left side of the larynx, and receiving large bloodvessels both from the carotid and axillary arteries. The cranium was quite perfect and the brain and dura mater normal.

The third paper is on the "*action of belladonna upon the mammary glands*," as a means of preventing and arresting mammary abscess, by Mr. Richard Marley. The writer has employed it in over forty cases, under circumstances most likely to produce mammary abscess, with a success which, he affirms, has enabled him heartily to recommend its early application. After pointing out the importance of the purity of the extract used, he lays down the following rules for its employment.

It is to be smeared on, not rubbed in. Friction is liable to injure the already irritable and inflammatory gland. The application should be made night and morning, or oftener, according to the urgency of the case and symptoms.

In summer the extract may be applied pure, or mixed with a small portion of glycerine. In the winter, when the extract is firm and unyielding, it requires to be well rubbed up with glycerine, in the proportion of two or three drachms of the latter to one ounce of the former. For fanciful ladies, a few drops of essence of amygdale may be added. The bosom should be kept supported by a broad handkerchief. The bowels are to be kept well open by salines. The diet should be spare. The patient should be warned that smarting will occur if any of the extract get in the eye, and that, if the infant be suckling at the well breast, care be taken none gets into its mouth. The use of the extract should be commenced with early, the moment there is the slightest indication that an abscess is about to occur. The extract should be applied over the entire surface of the affected breast, the areola included.

Dr. Marley remarks, that in "all large suppurating inflammations near the surface," the application of the extract of belladonna is attended with an almost immediate alleviation of the painful shooting and throbbing. The process of suppuration may go on, but the pain, frequently so distressing, is checked.

A description is given by Henry G. Times of a "*large fibrous tumour of the womb*," in a case which terminated in the death of the patient. The most interesting feature in this case was the fact that, notwithstanding the small amount of pain and constitutional disturbance experienced by the patient during her life, it was shown, upon examination after death, the tumour had grown from and *out* of the womb, and, owing to its excessive weight, had completely disconnected the cervix from the body of the uterus, as was proved by a probe, when passed through the os tincæ, entering a cul-de-sac, about an inch and a half deep.

A most interesting paper follows next, on "*Midwifery in the East*," by Dr. J. Jackson. The paper gives not only a succinct account of the practice of midwifery as it prevails in the East among both the European and native populations, but also of some of the diseases to which women and children are there liable. We had marked a number of passages for insertion in our present notice, but must content ourselves with quoting alone the following.

"In regard to the native woman, the mode of conducting the process of parturition is simple enough amongst the poorer class, and it is astonishing how quickly they recover from the effects of the labour, being able to go about their household work on the third day. With the higher class of native women, where caste prevails, the poor creature is considered an outcast at this particular time; and instead of having every tenderness and affection lavished upon her, as in this country, she is placed during the pangs of labour in the meanest hovel in the yard, as an unclean creature, or she is put into a matted shed in a lower verandah of the house, where, lying upon the floor, she is exposed to the heated fumes of wood and charcoal fires, which induce a degree of stupefaction and anæsthesia.

And thus, in their way, the Hindoos would seem to have discovered a plan which for ages has been in use before ether or chloroform, for a similar purpose, was found out. This process goes on during the whole period of labour. The temperature of the room is greatly raised, and it is filled with smoke; and were it not that there is free ventilation through the interstices of the matted walls and roof, the patient, as well as attendants, would run the risk of being poisoned.

"At the moment of delivery the woman is placed upon her back, her legs outstretched, and the midwife, seated on the ground in front, continually applies oil to the vagina and soft parts with her hand. At the time of protrusion of the head she places her feet at the nates and perineum, and bending over, with her hands she supports the vertex and steadies the entrance of the head into the world. At the time of delivery a firm cloth is tightened over the abdomen whilst the afterbirth is coming away. Stimulating warm powders, containing cloves, pepper, and ginger, are administered, and the room is kept warm for some few days. But she is considered impure for many days, according to the caste she has. A Brahminian woman is considered unclean for twenty days; other castes require twenty-eight days."

"It is rarely that the aid of the European obstetric is demanded for the native female. The latter, however, marry so young, and at times there is such a disproportion in size between the sexes, especially in the Mussulman population, that in such ill-matched unions there is delay in the delivery of the child, and the aid of the forceps may be required; but this is very rare."

"Occasionally the native midwives in India, as elsewhere, make use of violence, and I have known the head of the infant to be separated from the body, or the body placed in such position that the aid of the European surgeon has been required; such as when the arm has been firmly drawn out through the vagina. One case, from a trustworthy authority, was related to me, where the uterus was entirely inverted, and the midwife removed the whole organ, by dividing the parts with a knife. I have seen myself such cicatrization to have been caused as to close entirely the passage of the vagina, and thus prevent the escape of the catamenial discharge. This case was brought to my notice by the husband, who stated that his wife had been delivered, after a hard labour, nearly three years before. A crucial incision gave discharge to a treacle-like fluid, the retention of which had produced a distended state of the abdomen, that had been considered by the native practitioner to be the result of dropsy, and had been treated as such by him. I have seen closure of the vagina in a young girl giving rise to a somewhat similar condition."

We have next a "*case of Fallopian pregnancy*," terminating fatally, by Henry Grace, Esq. These cases are always interesting. They must be studied, however, in detail to derive from them data for the establishment of a correct diagnosis in cases in which extra-uterine fœtation is suspected. The fœtus in Mr. Grace's case was contained in an enlargement of the left Fallopian tube about its middle. It was about the size of a walnut, and had adhering to it a small clot of blood.

"On carefully incising this enlargement, a layer resembling the deciduous membrane presented itself within the tube connected with the chorion. On a deeper incision through the amnion, about a drachm of liquor amnii escaped, and an ovum of about six or seven weeks was plainly visible. The uterus was not at all enlarged or congested, and on laying it open no deciduous membrane was seen. It presented the usual appearance of the unimpregnated state. Dropsy had commenced in the right ovary, which contained about three ounces of fluid. A corpus luteum was present in the left ovary."

The seventh paper is on "*concealed accidental hemorrhage* at the latter end of pregnancy and during labour," by J. Braxton Hicks, M.D. This formidable complication of labour is very rarely met with. Though it is referred to by nearly all the leading writers on midwifery, none appear to have seen themselves cases in which it had occurred; the cases instanced by them being all of them recorded by others. After a "lengthened" research, Dr. Hicks states that he had succeeded in finding memoranda of only fifteen cases. He presents a synopsis of these, and adds the history of eight others, one from his own practice and seven from the practice of his contemporaries.

Of these cases 15 terminated fatally, one in which the hemorrhage occurred at the 7th month of pregnancy; one at 7½ months; one at 8; one at 8½; eight at full term, while in three the period is not recorded.

In the 8 cases which recovered, in one the hemorrhage occurred at the 6½ month of pregnancy; two at 7½; three at 8; one at 8½; and *one* at full term.

The state of the membranes where mentioned, was as follows: in those who died, they were ruptured naturally or artificially in 9; unbroken in 2. In those who recovered they were ruptured artificially in 7; no case is given in which they were not broken.

The age of the patients is recorded in only 13 cases; where the age is not mentioned, some appear to have had many children. Of those who died, 1 was aged 36 years; 2 were aged 38; 4, 40; 1 was aged 42; 1, 48. Of those who recovered, 1 was aged 40 years; 1, 42 years; 1, 32 years; and 1, 23 years.

Referring to the diagnostic symptoms alone; the most prominent and constant is faintness or collapse, which very frequently takes place suddenly. Almost as constantly is observed a great distension of the fundus uteri, causing it to protrude to an unusual extent into the epigastric region, attended with an indistinct, doughy feel, the outline of the fœtus being lost at this part. In about half the cases, a very distressing sensation, "as if about to burst," was experienced by the patient, with or without pain or tenderness on pressure. There is almost always a nearly entire absence of true labour pains on the first occurrence of faintness, and for some time after. In nineteen of the cases recorded, there were labour pains only in three, and in one of these they were very slight.

From rupture of the uterus concealed hemorrhage is very readily distinguished in cases of the former where the fœtus has escaped into the cavity of the abdomen. But when the rent is small and the fœtus has not escaped, the diagnosis will be more difficult. Here the pain attendant upon the rupture of the uterus, and the change in the form and size of the latter contrasted with the increasing enlargement, and indistinct feel of the fundus, which are present in cases of concealed hemorrhage, will indicate that the uterus is becoming filled rather than emptied. The location of the pain, the presence of pregnancy, the absence of any violence or previous disease, the increasing bulk of the uterus, are sufficient to distinguish concealed hemorrhage from rupture of some other internal organ.

Ordinary fainting, a common occurrence during pregnancy and labour, may, when severe and protracted, be mistaken for concealed hemorrhage. The hand placed upon the uterus will detect the peculiar state of that organ, and lead to a suspicion of the cause of the fainting; and the pain at the fundus, when any is present, will increase the certainty of the diagnosis, especially in cases where the patient has not been exerting herself, nor has been exposed to violence, and if the liquor amnii has already escaped.

From an analysis of all the cases referred to by Dr. Hicks, it appears that the more advanced the pregnancy the more fatal does concealed hemorrhage become; and this because of the more easy separation then of the placenta; of the capacity of the placenta, from its increased diameter, to receive and retain beneath it a greater amount of blood without destruction of its marginal attachment, and also from the large capacity of the vascular system, permitting more blood to be effused in a given time than at an earlier period; and, finally, from the uterus being already distended to its normal extent, it becomes, from the increase of its contents, less capable of expulsive efforts, and the uterine sinuses are thereby more patent, in consequence of the arrangement of their falciform pseudo-valves.

In regard to the proper treatment of this formidable accident, Dr. H. believes the indications to be clearly to empty the uterus, and to detach the placenta wholly at as early a period as is compatible with the safety of the mother. From the simple rupture of the membranes we are not, it is true, to expect the same prompt relief as in the ordinary cases of accidental hemorrhage. Still, as the evacuation of the waters tends to hasten labour, we should employ it, if for no other purpose, as well as the other methods now pursued in this form of flooding.

"But when the patient is *in extremis*, it seems best," Dr. H. remarks, "rather than empty the uterus at once, which may be a fatal operation, to support plentifully with stimulants, rupture the membranes, if not already broken naturally, apply very firm external pressure to the uterus, especially at the fundus, with cold, and wait till a little improvement takes place; as the system revives, secale should be given, or galvanism, if at hand, employed to excite the uterus to contract. Should the parts be dilating or dilatable, and the uterus fail to respond, it seems useless to give any more time for a fresh effusion; therefore, if the child's head be low, seize it with the forceps, or if *in utero*, turn as gently as possible, of course, in all cases keeping the uterus in as active a state as possible by the above means, and by frictions and pressure during the expulsion of the infant, blood, and placenta."

The subject of the next paper is "*Special Position and the Obstetric Binder, as Aids in the Treatment of Impeded Parturition.*" By Robert Hardy.

An abstract of this paper was given in the number for July, 1860, pp. 265–6.

Dr. Graily Hewitt details an interesting case of "*hydatidiform degeneration of the ovum*," after expulsion of which the patient did well.

The tenth paper gives the history of a number of "cases of *menorrhagia treated by injection*, or by the removal of the uterine mucous membrane by the gouge, or by both means combined." It is from Dr. C. H. F. Routh.

In obstinate cases of menorrhagia, Dr. R. refers to two conditions of the uterine mucous membrane which require to be corrected: one is the presence of polypi of various sizes and number, growing from its surface; the other is a softened condition of it, probably inflammatory in character, which bleeds upon the slightest touch, in many cases upon the slightest movement of the patient.

The injections that have been employed are tr. iodine, diluted or undiluted, a strong solution of tannin, or the tr. ferri muriatis.

Previously to injecting the uterus, it is essential, in order to prevent injury from the retention of the fluid thrown into the uterus, to dilate the latter by the use of the sponge tent for three or four days, until the cavity is large enough readily to admit the index finger. Dr. R. now draws down the uterus by means of a peculiarly constructed, corkscrew-shaped hook, which neither compresses the cervix, nor endangers the tearing of the os. When the entire uterine mucous membrane has been removed by a proper instrument, several of which are described in the paper before us, about half an ounce tr. iodid. co. or tr. ferri sesquichlor. is conveyed by means of an elastic gum catheter to the superior portion of the uterine cavity, and allowed to flow down through a speculum into the vagina. If pain sets in, an opium suppository is applied within the rectum.

"One application of the injection," Dr. R. remarks, "often suffices, but more lately I have repeated, in very bad cases, the injection from three to five or even six days, so long as the os continues patent enough to admit a goose quill high up. After the second or third day, a reddish, mucous discharge begins to flow, where tr. ferri sesquichlor. has been used, accompanied with large, thin, black flakes, which look very like scales of charcoal; this is, however, soon replaced by an ordinary leucorrhœa, and the cure is generally complete. The operation may sometimes fail in those cases where the hemorrhage is due to a softened, probably inflamed, villous membrane, if the whole diseased part of the mucous membrane, or perchance some polypus growing upon it may not have been scraped away. The disease may, therefore, at no distant period, reappear. Now, I believe that in many of these cases the injection, if applied at once, corrects the error of the operator, by constringing, and then setting up a healthy and absorptive action in the lining membrane of the uterus, and particularly in the diseased parts accidentally left behind. Indeed, this absorptive action, it might be said, in some measure, was set up by the very sponge tent itself."

The scraping of the uterus, it is remarked, is not required in every case. Injections, preceded by a sponge tent, and repeated frequently, may obviate the necessity of the gouge.

We have next the history of an interesting case of "*complete obliteration of the canal of the small intestine* by fœtal peritonitis," in which Amusat's operation was successfully performed by R. Druitt.

The twelfth paper is on certain phenomena, facts, and calculations, incidental to, or connected with "*the power and act of propagation in females of the indus-*

trial classes" in London, derived from the experience of two lying-in institutions. Embracing a period of eleven years, during which upwards of 12,000 cases were carefully observed. The paper is drawn up by Dr. A. B. GRANVILLE.

Basing his observations upon 16.258 cases in which the age of the women was ascertained, Dr. G. sets down the average date of pregnancy as $29\frac{3}{5}$ years; adding the multiparous women it becomes 30. The earliest age at which pregnancy occurred was 13 years, of which 5 cases occur. Under *fifteen* years, pregnancy occurred in 15 cases; under 18 years, in 102 cases. The latest period of pregnancy was in the 55th year of age, of which 3 cases are recorded. The entire number of cases in females over 45 years of age, was 59; in females over 46 years, 38; in those over 47, 29; in those over 48, 23; in those over 49, 14; and in those over 50, 11.

Of the single births, out of 16,258 cases of parturition, 6,615 were boys, and 5,863 were girls: total, 12,478.

In respect to the condition of the children born alive, one had one arm shorter than the other; one had a cleft palate—spina-bifida—no testicles externally or internally; impervious urethra; urine in bladder; one had ascites; one had deformed feet; one was variously deformed;[1] one had spina-bifida simply; one had cleft palate, hare-lip, and absence of one half upper jaw; one had depressed parietal bone; another, the same, with the longitudinal edge of the bone pulling the membranes of brain and the scalp, over the longitudinal suture, on the stretch, protruding upwards—left eye also protruding. One child, born of a mother who died on the seventh day of phthisis, weighed *eleven pounds*, and measured fourteen inches.

Of 12,478 births, 277 were still-born—151 boys, 126 girls. Of these, 20—11 boys. 9 girls—were born before the full period of gestation. Fifteen children—4 boys, 11 girls—were born alive before the full time, by several weeks. Three children—1 male, 2 females—were born at 6 months, alive.

In respect to the mortality among mothers, in 12,423 cases of labour, it occurred *once* in 500—the total number of deaths being 25.

The total cases of twins in 12,618 births was 136—of these, both were boys, in 35 cases; both girls, in 51 cases; and a boy and girl in 50 cases. The proportion of triplets was one in 1,051 labours, or a total of 12 cases in 12,618 labours. The total children in these multiple births was 284—128 boys, 156 girls.

The number of pluriparous women who had twins, 136, or 1 in $91\frac{17}{22}$; who had triplets, 4, or 1 in $3{,}119\frac{1}{4}$. Children produced, 284. Of whom were alive, and at the full time, 252; alive, and before the time, 7; stillborn, 25, or 1 in 10.216 cases.

Instrumental cases in 12,423 cases of labour. 52; number requiring manual interference, 46; number in which the head was perforated, 9. Number of cases in which morbid accidents intervened, 62, namely, hemorrhage, 23; convulsions, 4; locked jaw, 1; syncope, 2; retained placenta, 24; abnormal pelvis, 6; total suppression of uterine action, 2. Proportion of cases with accident to entire number of births, 1 in 200.37.

In 12,423 labours, the presentation was of the head in its normal position in 12,156 cases; in an abnormal position in 21 cases, or, 1 in $591\frac{5}{10}$, of these latter 1 terminated naturally, 4 required manual interference, and 16, instrumental. The face presented to pubis in 52 cases, or 1 in $238\frac{9}{10}$—42 terminated naturally, and 10 were instrumental. The hand presented, with three complications, in 29 cases, or 1 in $438\frac{3}{10}$—7 terminated naturally, 19 required manual interference, and 3, instrumental; in 91 cases, the breech presented, or 1 in $136\frac{5}{10}$—79 terminated naturally, 6 required manual interference, and 6, instrumental; in 54 cases, the feet, with two complications, presented, or 1 in $230\frac{5}{100}$—48 terminated naturally, manual interference was required in 4, and instrumental in 2; in 11 cases, the funis, with one complication, presented, or 1 in $1129\frac{4}{11}$ cases—10 terminated naturally, and 1 required the use of instruments; there were 9 cases of placenta prævia, or 1 in 1380 cases—3 terminated naturally, 5 required manual interference, and *one*, instrumental.

The next paper is the history of a case of "*ruptured perineum, and birth of*

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[1] See London Med. and Physiol. Journ., vol. i. p. 175.

the child between the os vaginæ and anus." It is by J. Baker Brown. This accident appears to have resulted from an unyielding condition of the os vaginæ. The relator suggests the propriety in similar cases, at the time of the severe pressure on the perineum, when the os vaginæ shows no disposition to dilate, to divide the latter freely on each side with a blunt-pointed bistoury, so as to prevent the possibility of this peculiar lesion.

We have next the history of a case of "*congenital hernia* (?) *of the liver.*" By Dr. A. Meadows. It is a curious case, but presents no point of especial interest.

The 15th paper is on the etiology of "*phlegmasia dolens,*" by Dr. Wm. Tilbury Fox.

Upon a careful analysis of the causes to which phlegmasia dolens has been ascribed by the different writers who have treated of it, and the various circumstances under which it has been observed to make its appearance, Dr. Fox believes that these lead to the deduction that the disease is occasioned by an impediment to the free return of blood and lymph from the affected part, and that the causes of such impediment may be, so far as regards the vessels, extrinsic or intrinsic. Of this somewhat elaborate and highly instructive paper, we regret that, without exceeding the proper limits of a biographical notice of the volume before us, we can present merely the general propositions assumed by the author, referring our readers to the paper of Dr. Fox, for an exposition of the facts and arguments upon which these are based. The propositions in question are as follows:—

"1. In phlegmasia dolens both veins and lymphatics are obstructed.

"2. The obstruction may be due simply to extrinsic pressure.

"3. Or, to inflammatory changes in the coats of the vessels leading to coagulation (this depends upon virus action). Except during epidemics of puerperal fever, this is not so common as supposed.

"4. It is pretty well admitted that rapid ingress of abnormal fluid suddenly, and in large amount, will cause instantaneous coagulation of the blood; and it is also admitted that large drains upon the system are followed by rapid and compensatory absorption. There is good reason for believing that these conditions are fulfilled, in a perfect and ample degree, in conjunction with the presence of wound—facilitating absorption—in a great many cases, prior to the occurrence of phlegmasia dolens, and that the latter is frequently thus evolved.

"5. These different modes of evolution may be more or less conjoined."

The subject is continued in the next paper, by the same author, on "*the pathological lesion of phlegmasia dolens.*" In this are examined "the essential condition of the limb" in phlegmasia dolens, and the manner in which this condition is produced.

We are unable to follow the writer in his investigation of these two questions; as we have done in respect to the preceding paper, we give merely his general conclusions, viz:—

"1. That obstruction to the lymphatics obliterates one of their functions (complementary in relation to the nutrition of the cellular tissue); the excess of pabulum not being removed, hypertrophy ensues, with retention in the interstices of fibrinous material, all of which are favoured by hyperinosis, hyperæmia, &c. 2. That this is the ample disease—phlegmasia dolens. 3. That a virus may produce obstruction to the venous and lymphatic currents, and thus phlegmasia dolens; but, in this case, eliminative and special reparative actions ensue, which are superadded conditions, not peculiar to, not essentially a part of, phlegmasia dolens, but especially related to the blood-disease, in which phlegmasia dolens occurs."

The 17th paper is the history of an enormous "*fibrous tumour connected with the uterus,*" in the practice of Dr. R. U. West, reported by Dr. Graily Hewitt. The patient was 53 years of age, and died from an attack of uterine hemorrhage. The existence of the tumour had been repeatedly diagnosed for the space of ten years. It was firmly adherent to the abdominal parietes anteriorly, it weighed 42 pounds; its diameter was about 16 inches, and its circumference 44 inches. Bands crossing and constricting the vagina half an inch below the os uteri, prevented the latter from being reached by the finger.

The substance of the tumour was hard and resistant; it possessed a fibrous texture, septa running in various directions. It had been apparently moulded to the shape of the abdominal walls. The section was white, firm, and showed large vessels. No evidence existed of softening at any part—the structure was everywhere uniform in composition. The connection of the tumour with the uterus was very slight; it apparently proceeded from the anterior or the posterior (which, it is difficult to say) portion of the cervical part of the uterus. Firm, fibrous bands passed off from this part of the uterus to the tumour, but the main part of the connecting substance was composed of cellular tissue and large vessels. The connection between the uterus and tumour was not more than three-quarters of an inch in thickness.

The next paper is the history of a case of "*hydatidiform degeneration of the ovum*," by Dr. C. H. F. ROUTH. After suffering from various obscure uterine symptoms, with menorrhagia, for some two years, the patient was finally attacked with severe hemorrhage and regular uterine pains—finally, a large mass of hydatidiform bodies was discharged, together with the uterine membranes. The treatment adopted was the application of cold cloths, and scruple doses of secale cornutum every half hour, with a little cold brandy and water to relieve a feeling of weariness. The recovery was good, all hemorrhage ceasing after the expulsion of the membranes.

The treatment in cases like that here described is evidently to cause the expulsion of the dead ovum, and thus stop the constant drain on the patient's strength. Dr. R. suggests the dilatation of the os uteri by sponge-tents, so as to make out certainly the nature of the body present and to favour its removal or expulsion.

Following Dr. Routh's paper is the description of "*two fœtal monsters*," by Dr. T. H. TANNER.

One of these monsters presented two well developed heads, four upper and four lower extremities; a single large thorax; a single abdomen. The parts of generation, those of a female, were complete in each infant. Dissection had to be delayed until decomposition occurred, but it was easily made out that there was only one thoracic cavity, with two lungs, one heart, and one sternum. The abdominal cavity was likewise single, having but one liver and one spleen, two kidneys, and one set of intestines. There was only one umbilical cord and one placenta.

The second monster was affected with congenital umbilical hernia. There was a large fissure at the epigastric region, above the umbilical cord, the part of the abdomen which naturally remains the longest open, and which, in this case, an arrest of development had prevented from closing at that period when a portion of the abdominal viscera is contained in the sheath of the umbilical cord. Below the umbilical region the integuments were in a healthy condition. The hernial sac was formed of two coats, externally by the amnion and internally by the peritoneum. These had been ruptured, showing the contents of the hernia to consist of the intestines and liver, and at the upper part the heart. The fœtus was dead when born.

We have next the account of a case in which a "*fœtus* was *retained in utero for some weeks after its death and decomposition*," reported by Drs. NEWMAN and HARLEY.

From the history of this case we learn that a fœtus, conceived in November, after passing through four months of uterine life without any unusual occurrence, died in March from some non-evident cause, and, yet dead and decomposed, was retained in utero for three months more; its ultimate expulsion being determined, not by the uterus resenting the presence of a lifeless mass, but by the accidental separation of a portion of the placenta from the uterine wall, with consequent hemorrhage into the substance of the placenta, appearing also externally; by this, uterine action was induced, and the subsequent extrusion of the contents of that viscus.

A case of "*extra-uterine pregnancy*" is narrated by Dr. CHARLES DRAGE. The case is an interesting one. The patient considered herself pregnant, and expected her confinement to take place in June or July, 1852. In January, 1852, suffered from violent attacks of pain principally in the region of the transverse colon, with obstinate constipation and constant vomiting. Catamenia occurred three times regularly before the end of March, when there was another attack of pain. Between the end of June and beginning of August a good deal of hemorrhage occurred at intervals. From this time onwards the catamenial periods were quite regular. Intumescence of abdomen as in pregnancy. Uterus felt larger than in the unimpregnated state. Placental bruit heard distinctly, but no sound of fœtal heart. Cervix uteri shortened, as at the eighth month.

From the month of June the abdomen gradually diminished in size, and by June, 1853, was nearly in its natural condition. There was always, however, a distinct tumour to be felt deep down in the pelvis, but which caused no pain or uneasiness. The patient continued very well all the autumn and winter; in January, 1854, she went on one or two occasions to a dance. From February, 1854, she suffered from morning sickness, and had had an offensive discharge from the vagina for several weeks previous to the middle of March, when, upon examination, an oval opening with rounded edges, and of a size to just admit the point of the finger, was detected in the posterior wall of the vagina: an examination per rectum disclosed an opening in its anterior wall corresponding with that in the vagina, and similar in character. Through both openings a mass lying between them and feeling like bone, was made out. There was entire loss of appetite, constant vomiting, and great emaciation. She was sent into the country and put on sherry wine and pale ale. By the 27th of April, 1854, the patient having somewhat improved in health, Dr. Drage, after dilating the vaginal opening with his finger, extracted, by means of a pair of lithotomy forceps, after a good deal of trouble, a quantity of fœtal bones—phalanges of fingers and toes, and the left temporal bone, entirely free from muscle. On various occasions, up to May 20th, he removed others, and on that day a large putrid mass, being apparently the spine and ribs, with the dorsal muscles still attached. He had now obtained an almost complete fœtal skeleton. By June 8th, nothing more was to be felt. The finger passed freely into the rectum, and upwards into the sac. The openings had considerably contracted. It was advised that a small piece of sponge should be worn in the vagina, to prevent the fecal matter entering from the rectum. By June, 1860, the patient was perfectly well, and much stouter than at any time previously. Experiences no inconvenience from the openings, save when the bowels are much relaxed, and then only a very small quantity passes per vaginam.

The twenty-second paper is on "*some of the exigencies connected with preternatural labour.*" By Jos. T. Mitchell. The object of this highly instructive paper is to point out some of the quicksands into which the obstetrician is liable daily to fall in the course of his ordinary duties, and the common rules to guide him in their avoidance. These rules we shall give entire, remarking, that the whole of Mr. Mitchell's remarks are worthy of a careful perusal on the part of every obstetrician, especially of those who have recently entered the field of obstetrics. His rules for avoiding the quicksands referred to, are:—

"1st. He should never omit to inform himself accurately as to every particular connected with every former delivery, when his services are engaged in any case in anticipation of an approaching labour, so that he may be quite prepared to act judiciously, as circumstances may dictate, either before the event, or at the time thereof.

"2dly. He should carefully educate himself, so that he may acquire a good and accurate diagnostic touch—absolutely necessary to guide him in ascertaining accurately, early in labour, the true nature of the presentation, as well as the capacity, normal or otherwise, of the bony passages—a desideratum essential in every good accoucheur.

"3dly. He should take care never to allow of the possibility of any evil consequence following an unnecessarily protracted labour, which he had the means of preventing by adopting early and judiciously applied manual or instrumental aid

"4thly. He should never omit to induce premature labour in cases where permanent mechanical interruptions in labour at full time were previously known to exist, by puncturing the membranes at the legal period of seven months and a half, or at eight months' gestation, which can so easily and safely be done by using a proper instrument for that purpose.

"And, 5thly. In the present improved condition of instrumental appliances for delivering in craniotomy, &c., he should never rely on the use of such an instrument as the crotchet, which, in the hands of even reputedly expert operators, has been known often to produce great injury, sometimes to the operator, but more frequently to the patient."

In the next paper we are given by Dr. JOHN H. DAVIS, a description of a "*double battledore placenta, with a single umbilical cord, connected with one child.*" The case is curious, it is true, but of little practical importance.

Then follows the history of a case of "*sudden apoplectiform seizure, terminating fatally in thirty-five hours, on the sixth day of lying-in.*" By Dr. R. UVEDALE WEST. The seizure occurred unexpectedly, after a very easy, quick labour, without any appreciable exciting cause. The symptoms were not certainly those of apoplexy, properly speaking. The patient was semi-comatose, and affected with only apparent loss of voluntary power in the limbs of the right side. The head only was examined after death. The appearances detected are thus described:—

"The dingy, dirty, freckled complexion of face was now more striking than during life. On incising the scalp down to the pericranium, there was a considerable escape of gas. There was a patch of extravasation as large as a crown piece inside the scalp, covering the left side of the occiput, and a similar smaller patch in the same situation on the right side." These were possibly bruises the patient had inflicted on herself in her turbulent movements. "The skull was unusually thin. The brain was much congested on its surface, but its tissue was healthy, with the exception of some small patches of softening outside of the left choroid plexus. The lateral ventricle on that side was empty, but the right lateral ventricle contained a considerable quantity of serum of a slightly bloody tinge. There was no extravasated blood anywhere in the brain. The cerebellum was healthy throughout."

Paper twenty-five is the account of a case of "*ovarian tumour weighing seventy-six and a half ounces, in a girl of twelve years and a half old,*" terminating life suddenly by asphyxia. It is related by R. FAWCETT BATTYE.

The cause of death in this case is set down as evidently asphyxia, arising from the unyielding nature of the abdominal walls, not allowing the tumour to become more prominent anteriorly, and consequently the pressure, taking the line of least resistance, was directed upwards towards a very enlarged liver through the medium of impacted intestines.

The twenty-sixth paper is "*An Inquiry into the Correctness of the Doctrine of William Hunter in regard to Retroversion or Retroflexion of the Gravid Uterus.*" By Dr. W. TYLER SMITH. A full abstract of this paper was given in our number for January of the present year, pp. 279–80.

A curious case of "*spontaneous evolution of the fœtus in utero,*" in which the head changed for the feet, is related by Dr. RICHARD HODGES. It was a first labour. Upon the first examination, the head was clearly and distinctly made out as the presenting part. After an interval, a second examination was made, when both feet were found in the upper part of the vagina, just through the os uteri, the child having actually revolved within the uterus.

The next case is an instance of the serious effects of "*reckless vaccination,*" by ROBERT DRUITT. A healthy infant was vaccinated with lymph brought to the house on points. The operation was performed by making a series of parallel scratches close together, and covering a space of one inch by three-quarters. The arm inflamed severely, swelled from shoulder to elbow, and numerous small vesications appeared on the inflamed skin. The part operated on finally sloughed, leaving a very deep and ugly cicatrix.

The twenty-ninth paper is the history of a case of "*abnormal gestation,*" by ROBERT HARDY. A lady twenty-two years of age, in the seventh month of pregnancy, was attacked with pain in the left side of the abdomen, shooting down toward the pubis, which was relieved by an opiate and laxative, with perfect quiescence. Some days later the pains returned with increased violence, with frequent fainting fits. Upon a careful examination of the patient, the uterus was found high up, its cervix an inch or more in length, conical, tapering off to the os, which was unusually pointed, and in contact with the sacrum. The inferior segment of the uterus was quite undeveloped, the organ to all appearance empty. External careful manipulation discovered a large oblong tumour in and extending obliquely upwards from the left hypogastrium to the crista ilii of the same side. All the pain was experienced in this situation, and did not extend across the pubis. Anodynes, camphor mixture, hot dry local applications, and aperients, produced little relief; pain and frequent syncope still continued.

Some ten days later the faintings had become less frequent. The pain of the left side constant, with now occasional exacerbations. The only alteration detected by examination per vaginam was increased moisture of a thin colourless character. (Qu. *liquor amnii?*)

Three days later abdominal pains rather increased, with more severe exacerbations of a somewhat expulsive character. During a pain the abdominal tumour became defined and hard, extending from the pubis obliquely upwards and outwards, and ending by a rounded margin within the left hypochondrium. Two days subsequently the pains were of a more aggravated character, assuming a decidedly parturient aspect. Examination per vaginam showed no change in the condition of the os, cervix, and lower segment of the uterus. The pains recurred every eight minutes; the tumour, without altering its shape and direction, became very hard. There was now detected a narrowed part crossing the tumour, about an inch and a half in breadth, and two-thirds below its summit. Towards midnight the pains, which had abated towards evening, became greatly aggravated. Next morning, being summoned in haste, Mr. Hardey found that a neighbour had drawn away a fœtus, which she said had come double, and was nearly born when she arrived; the placenta had been expelled naturally, it was said, just before Mr. H. entered. The fœtus was of seven months' development, and had been dead many days. There was no hemorrhage, and the cervix uteri had the same long conical shape, with the pointed os, as before. A lateral slit was detected extending through the cervix, quite up to the body of the uterus, as if it had been cut clean across with a knife. After some gentle kneading, the uterus was roused into action, when it was felt occupying the left iliac region, of the size of a small cocoa-nut. The mother speedily recovered, without the occurrence of any untoward symptom.

Mr. H. now learned, for the first time, that the late gestation was not, as he had at first been led to believe, her first. Early after marriage she had become *enceinte*. Towards the end of the third month of gestation her chair was removed as she was in the act of sitting down, causing her to fall suddenly to the floor; she was attacked with severe pain in the left groin, and aborted the next morning. Her health continued bad for three months, with more or less pain for several weeks in the groin. Soon after her recovery she became again pregnant, suffered at intervals considerable pain in the left side, and aborted a second time at the end of the third month. Her *third* gestation, with its results, forms the subject of the present case.

Mr. H. presumes that when the sudden fall occurred to the patient during her first pregnancy some lesion occurred in the peritoneal covering forming the left broad ligament, and extending to the uterus, the result being plastic effusion, forming in time an organized band of a comparatively inelastic nature, by which the uterus was prevented from rising upwards as gestation advanced, and giving it a direction to the left, forming ultimately the stricture by which the uterus became divided into two chambers, and imprisoning the ovum in the upper one till within four hours of delivery. This firm band across the lower third of the uterus would seem to account, also, satisfactorily for the undeveloped condition of the lower third of the organ, with its cervix and os. The advent of a labour at the close of the seventh month was evidently caused by the impossibility of any further expansion of the uterus, while its great severity and protraction were also due to the same cause.

The next paper is the history of a case, by Dr. R. Barnes, showing the influence exerted by a shortening of one leg from early age in inducing a "*symmetrical distortion of the pelvis.*"

In the case described, it is clear, that the main support of the body in the erect position, and in locomotion, was by the sound right leg. The muscles of the right side of the pelvis assumed, in consequence, a more active development, and caused a corresponding development of the bones to which they are attached. At the same time, the left side of the pelvis, without being actually atrophied, was very slowly developed. The result was a fully, perhaps an excessively, developed right half of the pelvis, a contracted left half, a narrowing of the conjugate diameter, and oblique distortion of the brim, and a pelvic cavity shallower on the left than on the right side. Dr. B. is inclined to believe that deformities similar in kind, but less in degree, the result of lesser degrees of "claudication," or of unequal muscular power of the legs, may not be uncommon.

Dr. J. G. Swayne describes a case of "*double monstrosity*." The junction of the two fœtuses appeared to extend from the umbilicus to the top of the thorax. The left fœtus was of full size, the right much smaller. The right arm of right fœtus, and the left arm of the other, were well formed, and widely separated. The two other arms were united together as far as the wrists, and above the elbows they were inclosed within the integuments of the thorax; the hands were separate. Both children were males. On dissection it was found that the ribs of each fœtus were united to a common sternum, to which were articulated, also, the four clavicles, and attached the four sterno-cleido muscles. There was but a single thorax, containing a single pericardium inclosing two perfectly distinct hearts. The only direct venous communication detected was a large branch which passed from the left innominata of one child to the right vena innominata of the other. The lungs and other thoracic viscera were those of two children. The ribs on the posterior side of the thorax were not fully developed; the free extremities in one fœtus lay close to, but not connected with, those of the other. There was a single diaphragm, and a large liver common to the two fœtuses. The single umbilical vein proceeded from the umbilicus to the anterior margin of the liver, and subdivided posteriorly to join the two inferior cavæ. The umbilical cord was composed of a single vein and four arteries. All the abdominal viscera, with the exception of the liver, were double. The two upper extremities that were united together, consisted of two clavicles lying side by side, and quite close together, and articulated to the common sternum. There were two scapulæ; and two humeri. These latter, however, were united inferiorly, forming "a single articular surface for the two ulnæ, which were united above, but distinct at their carpal ends." Between the two olecranon processes there was a deep groove for the ulnar nerves. Besides the above, there were no other anomalies in the condition of these extremities, excepting that they were inclosed in one common integument as far as the wrist.

A very interesting case of "*pelvic cellulitis* after a first pregnancy, followed by suppuration at the back and front parts of the vagina," is related by Dr. George D. Gibb. Nearly eleven weeks after the first symptoms declared themselves, an abscess pointed at the lower and back part of the vagina, and spontaneously evacuated itself, with complete contraction of its walls. Some matter also found its way to the anterior wall around the urethra, causing, no doubt, much of the difficulty of micturition complained of by the patient. The quantity of matter discharged did not exceed several ounces, to which fact Dr. G. attributes the successful result of the case. The strength of the patient was supported throughout by a liberal diet, and wine, with tonic and anodyne remedies. The patient, during the attack, could take nothing warm—all her food had to be swallowed cold. The catamenia appeared seventeen weeks after confinement, and continued regularly. Pregnancy subsequently took place, and a second child was born nearly seventeen months after the birth of the first, without any inconvenience or bad symptom whatsoever.

A case of "*annular laceration of the cervix uteri*," is related by Dr. T. Herbert Barker. It occurred in a patient forty-two years old, during her first labour at full term. The term annular is employed because a complete ring-like portion, consisting of the os and cervix, was torn off from the body of the uterus; the child having passed through the laceration and not through the os uteri.

"The cause of this kind of laceration is," Dr. B. remarks, "the protracted pressure of the head against a ring of the uterine parietes in a contracted pelvis;

perhaps also conjointly with a sharp linea-ileo-pectinea. An early discharge of the liquor amnii will, of course, tend to aggravate the mischief. The particular feature in the case related was the undilated os uteri—and the loose condition of the os and cervix uteri in front of the head—even to an advanced period of the labour. * * * It is probable that this will be found to be characteristic of cases of annular laceration, for it is in this way likely that the pressure of the head is concentrated upon a circle of the uterine walls, corresponding with the margin of the pelvis, instead of being partially expended upon the surface of the uterus below this point. The head is, in fact, impacted in the pelvis, pinching the walls of the uterus between it and the pelvic bones, but all parts of the uterus below this pressed ring and the head, are lax, and unaffected by the uterine pains. The head is continuously, and with immense force, pressed against the girdle of uterine wall, so that the parts are either cut through or thinned, softened, and sphacelated. The separated portion of uterus in this case had the appearance of having been thus pinched and thinned. The substance of the jagged edge was thinner than the structure of the uterus intervening between it and the margin of the os uteri."

Dr. B. thinks that the period at which the laceration occurred was that when, on the third evening of labour, the patient was seized by severe, continuous, and peculiar pain in the lower part of the abdomen, followed by the flagging of the true uterine pains. There was not the sudden cessation of pain as in rupture of the body of the uterus, nor was there prostration of strength, nor vomiting, but the pulse continued strong, undisturbed, and the patient in good spirits.

The 34th, and last paper, is on the "*value of anæsthetic aid in midwifery*," by Dr. Chas. KIDD. The paper is, upon the whole, a judicious one; pointedly in favour of the employment of chloroform in all prolonged and very painful labours; in cases where version or the use of instruments becomes necessary; in puerperal convulsions, etc. Dr. K. is not in favour of the indiscriminate administration of chloroform merely to allay pain in second, third, or fourth cases of labour where, from our knowledge of what happened in the preceding labour or labours, there is every reason to believe that the case will terminate shortly and favourably; he would restrict its use to first labours, or to such as are tedious and painful, or where manual or instrumental interference is required to conduct them to a favourable close. Dr. K. prefers chloroform to all other anæsthetics, and makes the startling assertion that "death occurs as often from ether as from chloroform." That very few accidents had happened from the use of ether, especially few indeed when compared with those which had resulted from the administration of chloroform, was a fact we had believed very generally acknowledged. We know that such is the impression of the medical men of this country. We regret that Dr. K. has not indicated the data upon which his declaration is based.

D. F. C.

ART. XIX.—*On Scrofulous Diseases of the External Lymphatic Glands; their Nature, Variety, and Treatment; with Remarks on the Management of Scrofulous Ulcerations, Scars, and Cicatrices.* By P. C. PRICE, F. R. C. S. E., Surgeon to the Great Northern Hospital, the Metropolitan Infirmary for Scrofulous Children, at Margate, &c. Illustrated with engravings on wood. London: 1861. 12mo. pp. 159.

A MONOGRAPH is here presented, based chiefly on the practical experience of its author, upon a subject whose importance is not lessened by its every-day familiarity to all practitioners. Although drawing chiefly upon his own observations at the hospital at Margate, Mr. Price has not neglected those of others, as recorded especially in the works of Wiseman, Lugol, Baudelocque, Guersent, Hufeland, Philips, Lebert, Tyler Smith, Ranking, Lloyd, Henning, and Goodlad.

Few terms in medical language are used more vaguely than *struma* and *scrofula*. Nor does the indefiniteness of these words, and of their corresponding adjectives, seem easy of removal. Mr. Price objects to the use of the terms *scrofulous* and *tuberculous* as convertible or synonymous.

"The term scrofulous may be applied to disease of a gland in which tubercle plays the chief part; but the word tuberculous cannot with the same propriety be used to denote the nature and characters of every so-called scrofulous gland which, although appearing in what is termed a tuberculous subject, is in no way dependent for its morbid alteration on true tuberculous deposition."

"The term scrofulous must therefore, sometimes, if not always, be employed to include both tuberculous and non-tuberculous diseases."

Affections of the lymphatic glands, skin, mucous, cellular, and other tissues, bones, joints, and various internal organs, characterized by a tendency to inflammation, ulceration, and suppuration, modified by inherited or acquired diathesis, are those to which, in compliance with usage, the name of strumous or scrofulous is applied in this work. The author's attention is confined, however, almost exclusively to disorders of the lymphatic glands.

The causes of the scrofulous diathesis are recognized as being all influences which depress vitality by withholding its necessary conditions of pure air, sunlight, warmth, and wholesome food. Thus formed, the diathesis is capable of transmission by parentage. The opinion of many of the older writers, as very strongly stated by Hufeland, that *syphilis* is the direct source of the scrofulous habit of constitution in many instances, is considered by our author to have been exploded.

Glandular affections are treated of very fully in this work, under the heads of—

I. Acute, Subacute, and Chronic Inflammation, or Lymphadenitis.

II. Chronic Enlargement, or Simple Hypertrophy of Structure, independently of Vascular Derangement.

III. True Tuberculous Alterations.

The distinction between these forms of glandular disease is insisted upon as being very important, not only for prognosis, but also with a view to treatment. It is also of consequence to distinguish between scrofulous disease of the glands and that which accompanies leucocythæmia. The greater proportion of so-called transitory scrofulous swellings of the neck, abdomen, and other parts, is believed to be caused by subacute or chronic inflammation of the glands. More than two-thirds of the cases of idiopathic glandular disease observed by Mr. Price were confined to the glands above the shoulders. Next in liability were those of the axilla; while those of the groin were affected in extremely few instances. Neither Louis nor Lebert mentions a single instance of tuberculous inguinal gland.

In Mr. Price's experience, glandular disease is decidedly more frequent, in early life, in males than in females. Of fifty tabulated cases, thirty-three were males, and seventeen females.

Other interesting statistics are given in this volume; as showing, for example, how rare is the supervention of glandular enlargement upon pulmonary phthisis; and that, although decidedly uncommon, the commencement of scrofulous or tuberculous disease of the glands sometimes occurs after fifty years of age. A few fatal cases are mentioned, in which great enlargement of the deep-seated glands of the neck caused death by impeding the functions of respiration, circulation, and deglutition. Of 140 tabulated instances of supposed tuberculous disease of glands, 82 proceeded to suppuration.

The comparative frequency of the occurrence of true tubercle in enlarged or suppurating glands, has been variously estimated by different authors. At the Hôpital des Enfans Malades at Paris, M. Guersent states that tuberculous disease has been found in one or more parts of the bodies of two-thirds of the scrofulous children dying between the ages of three and sixteen. Papavoine asserts that, of fifty scrofulous children examined, tubercle was discovered in the cervical glands of twenty-six. The proportion in the autopsies of Louis was one-tenth, in the bodies of those dying over the age of fifteen years.

The form of tubercle which occurs in the glands is almost invariably the yellow and "lardaceo-caseous," which seldom undergoes any metamorphosis except that of liquefactive degeneration. *Withering* occasionally takes place; cretifaction still more rarely.

Minute description is given by Mr. Price of the peculiar *cicatrices* of suppurating or ulcerating scrofulous glands. Often purple in colour, they are generally furrowed, wrinkled, bridled or puckered, and covered by a thin and imperfectly developed cuticle. Sometimes, on or between small arches or bridles of skin, they display buttons or threads, each surmounted by a black spot, apparently an abnormal product of follicular secretion. They are closely imitated by some slight cicatrices following burns of the face or neck.

We have, of course, the best reason to hope for useful information from the records of a special hospital, in regard to the *treatment* of scrofulous affections of the glands. Mr. Price has been, apparently, a careful observer, and has formed conclusions the study of which, with the practical reasons therefor, might be of decided advantage to many physicians.

Referring the reader to the book itself for their detail, we may state, that he regards hygienic management as of the greatest consequence; pure, and especially sea air, and bathing, with good diet, warm clothing, and sunlight, doing, in the Children's Hospital at Margate, very much towards the cure of all forms of scrofula.

In the therapeutics of glandular disease, the internal use of appropriate medicines appears to him to deserve the greatest confidence. Iodine, in his experience, is, *most generally*, of real service, especially in incipient or non-tuberculous struma of the glands, or, when tubercle exists, before it has undergone softening. So considerable, however, is the number of cases in which it will altogether disappoint, that it is in vain to place in it blind confidence as a specific. The usual combination of iodine with an alkaline metal, is said to be justified by comparative practical results. Mr. Price prefers the iodide of ammonium, recommended previously by Dr. B. W. Richardson, even to the iodide of potassium; the dose of the former being rather smaller, and its action more rapid. Intolerance seldom follows its administration. The symptoms, when it occurs, are violent pains in the throat, and heat in the stomach. With either of these salts, however, our author's experience, like that of Lugol, Baudelocque, and Ranking, is in favour of *small doses* long continued. Of iodide of potassium, for example. he gives, to a child, a grain, or half a grain, twice or thrice in the day, on an average; combining it, however, generally in use, with half the quantity of iodine, as in the formulæ of Lugol.

In any mode of employment, Mr. Price has met with no confirmation of the statements made by M. Rilliet, of Geneva, of the dangers of iodism. He has never known an instance of the drug exerting any destructive influence over the normal tissues of the body; although overdoses often produce nausea, giddiness, browache, lassitude, and mawkishness of the breath.

The commonly accepted opinion, that the constitutional influence of mercury is unfavourable to the cure of scrofulous disease, has been fully sustained in the observation of Mr. Price at Margate. The temporary use, especially of the *hydrargyrum cum cretâ*, is advised by him, at the onset of the treatment of many cases, in which the functions of digestion and secretion are at fault.

The ordinary view, that iron, mineral acids, vegetable bitters, and purgatives, are useful in scrofula only as analeptics and palliatives, without any of that effect which (as in the case of iodine) is called *specific*, is maintained in this work.

Cod-liver oil is believed by the author to be of great value; especially in that stage of tuberculization at which iodine proves the least serviceable; viz., when suppuration and ulceration have impoverished the system. He has administered it often, however, with decided advantage, at a much earlier period of glandular disease.

Lime, even in the simple form *liquor calcis*, he considers to be of use, particularly in the later stages of tuberculous degenerations. Of the hypophosphite of lime, in the treatment both of osseous and glandular scrofula, he speaks in terms of strong commendation. The compound of several phosphates, known under the name of "chemical food," mentioned as being "obtainable only from America," is also alluded to with favour, as having been serviceable in a number of instances.

As to local treatment, Mr. Price makes many useful practical remarks which could not be condensed into a sufficiently brief space for this notice. We will call attention only to his views upon the external application of iodine, and the surgical employment, in diseases of the glands, of caustics, and of the knife.

Iodine he believes to be capable of beneficial effect by its local as well as general influence; but not in the way in which, upon mere *routine*, it is commonly employed. He objects to the *unguentum iodinii compositum*, and still more to the tincture of iodine, as being *too irritating* to the skin. We are well satisfied, from frequent observation, that this objection is well founded; and that the former should be much diluted for use, while the latter might be, for external application, at least to scrofulous glands, dispensed with altogether. Mr. Price recommends an unguent composed of a scruple or a drachm of iodide of ammonium with an ounce of spermaceti cerate.

The employment of caustics before suppurative discharge has been established from the gland or glands affected, is not approved; unless, in tedious cases of enlargement, the mere introduction of small portions of *potassa fusa*, to produce a carefully limited destruction of substance. In obstinate glandular *ulcerations*, however, whether superficial or accompanied by extended sinuses, the application of caustics may be very useful. Either nitrate of silver, potassa fusa, or a strong solution of iodine may be used, according to the nature of the case.

Upon the question as to how soon a suppurating or softened tuberculous gland should be opened by the knife (caustic for this purpose being not approved), Mr. Price expresses himself in favour of waiting until fluctuation distinctly proves the presence of fluid, with some attenuation of the skin; but not longer. He holds it to be important to allow as small a part of the integument and neighbouring cellular tissue to be involved as possible. To this end, he sometimes taps a glandular abscess by the subcutaneous method, from a sound part; and, in opening a softened gland, confines himself to a linear incision of small extent, unless the contents of the swelling are not thus removable.

Disfiguring *scars* or *cicatrices* of scrofulous origin may, with perfect safety, and advantage in many cases, be destroyed or modified, either by *potassa fusa* or the knife. Much enlarged glands, either tuberculous or simply hypertrophic, may also, in well selected instances, be removed by excision; although the disease will sometimes return in the glands that are left. H. H.

ART. XX.—*Medical Jurisprudence.* By ALFRED SWAINE TAYLOR, M.D., F.R.S., Fellow of the Royal College of Physicians; Hon. M. D. Univ. St. Andrews; Member of the Royal College of Surgeons; and Professor of Medical Jurisprudence and Chemistry in Guy's Hospital. *Qui nescit ignorare ignorat scire.* Fifth American, from the seventh and revised London edition. Edited, with additions, by EDWARD HARTSHORNE, M. D., one of the Surgeons to the Pennsylvania Hospital. Philadelphia: Blanchard & Lea, 1861. 8vo. pp. 714.

A NEW edition of this standard text-book will, doubtless, be received with great satisfaction. The progress of experience in medical jurisprudence has been sufficiently rapid in this country to insure a demand for its most popular exponent at least equal to that for the London original. The absence of material competition, however, and the intense interest excited among British general readers and professional men by a succession of leading poison cases, have led to the exhaustion of a whole English edition since the last American reprint was issued here.

Another has been needed in this country for some time past, and has been delayed in its appearance only by the desire to present the forthcoming English edition, which Mr. Taylor had kindly promised to forward in advance to his American publishers. This edition, therefore, has been printed under the supervision of the American editor, directly from the advance sheets of the London publication, and comes out simultaneously with the London volume. The similarity of date, of course, has rendered unnecessary, on the part of the American edition, any references or other matter from European sources, as well as a large number within Mr. Taylor's reach from this side of the ocean. A considerable number of short notes and American cases have been added nevertheless, and the whole work has received at the hand of its experienced editor the usual close revision so necessary in the conduct of such matter through the press, at such a distance from the watchful care of its accomplished author.

Since its first appearance in 1844, as we learn from the author's preface to the last edition, no less than 15,750 copies have issued from the British press. This great success has encouraged him to persevere in his efforts to maintain the work on a level with the progress of medical and legal knowledge; so that notwithstanding very great changes and improvements required in the fifth edition, published in 1858, by the large accumulation of materials, many new cases and observations have been added, and every chapter has undergone a close revision.

Owing to the intervention of this edition of 1858 between the last American edition of 1855 and the present one, the improvement in the fifth American is very great in many respects, both as to arrangement and selection of cases, and in regard to many questions and precedents, which are much better understood than formerly, both in medicine and law. In fact, as the author truly observes, "when compared with the early editions, this may be regarded as a new work." Not that the principles or facts of the science are materially changed; "but during the last fourteen years, improvements in medicine and jurisprudence have taken place to so great an extent that a practitioner, whether of the medical or legal profession, would in the earlier editions, meet with deficiencies which on the present occasion it has been my special object to supply." We need not say that the same comparative progress, due in part at least to Dr. Taylor's own teaching through his successive publications, has been going on even more extensively, because more needed, in this country; while the American materials in the shape of cases and decisions as well as able works and papers, have been correspondingly increasing in amount and importance.

"In the section on POISONS, a modification of the definition of the term poison, and of the act of poisoning, has been rendered necessary by crimes of recent date. Additions have been made on poisoning by ammonia,—chronic poisoning by arsenic,—the absorption and detection of arsenic in the dead body,—poisoning by arseniuretted hydrogen,—the detection of absorbed mercury,—poisoning by Scheele's green, tartar emetic, locust beans, prussic acid, nux vomica, and strychnia. The chapter on the two last-named poisons has been entirely rewritten." The section on poisons has been still further condensed and shortened, the details being "given throughout in a concise form, as constituting only a part of the general science of Medical Jurisprudence."

For "that special information" on facts, whether of a legal medical or medico-legal kind which belong to the subject of Toxicology," he refers to the late edition of his work on Poisons, since republished by Blanchard & Lea.

"In the section on WOUNDS, the additions include the rules respecting dying declarations made to medical men,—the detection of blood on weapons and clothing,—the medico-legal examination of wounds,—the microscopical and chemical analysis of blood,—cicatrices,—locomotion after severe injuries,—and the effects of concussion of the brain and spinal marrow, illustrated by recent cases.

"Additional facts have been introduced into the sections on PREGNANCY, DELIVERY, and ABORTION; and new cases are appended to the subjects of Tenancy by Courtesy, Protracted Gestation, and LEGITIMACY. In the chapter on RAPE, additions have been made to the medical proofs of rape on infants and children.

"The chapters on DROWNING and other forms of death by Asphyxia will be found to contain new facts and cases; and, lastly, in the chapters on INSANITY, the sections on Homicidal Mania and Dipsomania have been corrected and enlarged."

The volume has been very accurately and handsomely printed; and, although so much improved in the character of its contents, is very little if any more bulky than in previous editions; in this respect, as in others, affording evidence of the judgment and skill of all concerned in its getting up for the use of the American reader. A material improvement on the English edition, for which we are disposed to be thankful, is to be found in a full list of contents and a much better index.

Art. XXI.—1. *A Knowledge of Living Things, with the Laws of their Existence.* By A. N. Bell, A. M., M. D.; late P. A. Surgeon U. S. Navy; Physician to Brooklyn City Hospital. New York: Baillière Brothers, 440 Broadway, 1860.

2. *The Physiology of Common Life.* By George Henry Lewes, author of "Sea Side Studies," "Life of Goethe," etc. In two volumes. New York: D. Appleton & Co., 443 & 445 Broadway, 1860.

3. *Studies in Animal Life.* By the same author. New York: Harper & Brothers, 1860.

Though designed chiefly for popular reading and study, the subject-matters of these works are such as to render an examination of them appropriate in a *Medical Journal.* They have one common aim, viz: the instruction of the community in a branch of science which is attracting increasing attention. We have long regarded instruction therein, not only as legitimate in the higher class of seminaries and colleges, but as a subject which should more extensively engage the attention of medical men, for their own benefit, as well as for the general good.

1. The first book on our list both in design and execution, with some exceptions, which we may presently allude to, conveys much valuable and interesting knowledge, and is well adapted to promote a regard for natural science and personal hygiene. It may be said to consist of two parts. In the first, the reader is presented with a succinct view of the progress of animal and vegetable life, from the most simple to the most complex forms of organization.

Starting with a description of the very first rudiment of a living being, *the cell*, a clear and comprehensive account is given of the mode in which that simplest form of life is gradually developed, with successively higher forms of organization, until the highest and most complex of all—the *mammal.* The various stages of increase in organization are happily illustrated, both by references to animal and vegetable objects, and abundant pictorial illustrations, rendering the elemental operations of life familiar to ordinary minds, and, in our judgment, despite the assertion of the author to the contrary, both "entertaining to the general reader," and "comprehensible to the academic student."

The first part of the volume (according to *our* division of it) concludes with a chapter on "The Consummation of Organic Development," whence the step is direct to a consideration of the conditions which sustain "the erect stature and expressive countenance of *man*," and the remaining half of the volume is devoted to a brief synopsis of human anatomy and physiology.

A rapid and "sketchy" account is given of the various tissues, the cellular, the adipose, the muscular, the osseous, the cutaneous, the nervous; and following these, the subjects of aliment, digestion, circulation, and respiration, have each a few pages devoted to them, while a comparatively minute and protracted exposition of the *senses*, claims a much larger share of attention, and the volume concludes with a philosophical disquisition on "our functions and faculties," and what is rather singularly denominated "the sum of life," as it is rather an essay on disease and death than life. Passing what we regard as an error very common in works of this popular character, the undue proportion of space devoted to a comparatively unimportant point of physiology and anatomy—the senses—we have to allude to one or two other matters which deserve a more accurate rendering than is here given them, especially as they pertain to questions which are at the present time pretty freely and frequently discussed in general circles. Thus, speaking of the means usually employed in warming dwellings, we find on page 192 the following:—

"Water is placed near furnaces *ostensibly* to supply moisture, it being assumed that the highly heated air by furnaces is deficient of (in?) natural moisture and too dry for healthy respiration. Such air is, indeed, very injurious and very irritating, but the remedy is worse than the disease."

In this we differ from the author *in toto.* It is impossible to heat the atmosphere of a dwelling, by any artificial means whatever, without a greater or less desiccation of the air, and unless the increased and unnatural dryness is compensated by vapour from some artificial source, the atmospheric demand for moisture will be supplied, to a greater or less degree, from the lungs and skin of those who inhale the over-dried air. It is the rapid evaporation from the cutaneous and respiratory surfaces that principally gives to the ordinary furnace-heated air its harsh and uncomfortable sensation, a result which can only be obviated, either by a rapid ventilation, and the influx of copious quantities of fresh external air, or by the artificial addition of moisture, by the evaporation of water placed in the air-chamber of the furnace, or better still the occupied apartment.

Dr. Bell very properly objects to the practice of too closely shutting the damper of a furnace or stove, but he gives as the reason, that "burning coals, after they have ceased to smoke, always give off carbonic acid in large quantities," which contaminate the air of the apartment. We would suggest that if anthracite coal is here alluded to (and this is almost the only fuel used in furnaces and stoves in this country), it gives off no *smoke* while burning, and the gaseous products of its combustion consist largely of carbonic *oxide*, as well as carbonic acid. The pungent larynx-irritating, cough-exciting ingredient of the air from a leaky furnace is chiefly the former; that which burns with a lambent blue flame, on the surface of an anthracite fire.

In the chapters on "Aliment and Digestion," and on "Respiration," we have a lucid statement of the most important points of these most important processes, well adapted to ordinary comprehension; but there are a few paragraphs which, either from a want of clearness of expression, or some other cause, convey erroneous impressions. Thus, on p. 226, paragraph 541 contains as many inaccuracies as periods; and while the next paragraph (542) asserts that the carbonic acid emitted from burning gas or candles "mixes,when cool, with the other heavy exhalations, and occupies the lower strata;" this is directly contradicted, and the facts correctly stated, in paragraph 549.

So also we are told, on page 196, that "the individual can *only* be sustained by an organic, and not by an inorganic food;" and yet in the next two lines it is contradictorily and correctly said, "It must not be supposed, however, that inorganic substances are useless in the nutrition of animals. On the contrary, the gases and minerals introduced with the water and nutritious decoctions, together with the ashy constituents and the salts, * * * all conduce to the necessities of animal existence." And again, "The substances required by animals for their sustenance and growth are of two kinds, the organic and the inorganic." These irreconcilable statements have probably escaped the author's attention, in the passage of the book through the press.

Though the opinion is not directly expressed, Dr. Bell seems inclined to the chemical theory of Liebig, on the subject of food, which Mr. Lewes, in his work on physiology, above mentioned, takes much exception to, and argues against, with no little acumen, especially in reference to the value of inorganic substances, which are to be considered in the light of food, as much as any of the organic matters used as such.

We are strongly tempted, at this point, to anticipate the course of our review of the works before us, and take up the discussion of the chemical theory of food, by quoting from the first volume of Mr. Lewes some of his remarks in answer to Liebig on this exceedingly interesting subject. But a desire to adhere to the plan marked out in this review, and the demand for the consideration of other important points, forbid the indulgence; but our readers will find, in the perusal of the *Physiology of Common Life*, a free and intelligent critique of the favourite idea of Liebig, enforced by quotations of facts, and other physiological writers, which carry great weight, and will be found of no little value in medical practice.

There are some other minor points and modes of expression and orthography (*e. g.*, Lichen *Icelandica*) to which a critic might take exception, but they are, perhaps, of insufficient consequence to justify further allusion, and some of the physiological facts presented are not fully up to the standard of the most recently obtained results.

The three works before us constitute a regular series (though of course unintentional) of instruction on the subjects of which they treat. The first being elemental in character, is well adapted, under the guidance of a proper instructor, to serve as a text-book of the rudiments of physiology, for the use of schools, &c., while the second seems as if intended, as it certainly is well adapted, to lead the popular student through the next succeeding steps; and the third forms a fitting apex to the pyramid of instruction in living things.

2. To the productions of Mr. Lewes we, therefore, now turn with no little gratification and profit. Unknown to us before introduced by these works, we have been most agreeably disappointed, and even surprised, at the evidences of thorough familiarity with the subjects upon which he treats, the originality of his views, the exceedingly happy manner by which he takes his reader along with him, and the abundance of his illustrations and elucidations. We had little idea how, like an agreeable picture, the inner organism of animal life could be laid open to view, and how pleasant, and even amusing, a tale could be made of a description of its functions and sensations. The author is, in fact, a writer of great power; combining fervency of thought, and force and copiousness of language, with imagery partaking of the poetical, yet withal an experimentalist, and a practical and minute observer, of a too rare type.

To our mind, he is to animal physiology what Hugh Miller was to geology, an original and acute observer, and a vivacious expositor.

Though by no means the best we could select, as a specimen of his descriptive powers, we present the opening paragraphs of his first volume, from the chapter on "Hunger and Thirst."

"Hunger is one of the beneficent and terrible instincts. It is, indeed, the very fire of life, underlying all impulses to labour, and moving man to noble activities by its imperious demands. Look where we may, we see it as the motive power which sets the vast array of human machinery in action.

"It is hunger which brings these stalwart navies together in orderly gangs to cut paths through mountains, to throw bridges across rivers, to intersect the land with the great iron ways which bring city into daily communication with city. Hunger is the invisible overseer of the men who are erecting palaces, prison-houses, barracks, and villas. Hunger sits at the loom, which with stealthy power is weaving the wondrous fabrics of cotton and silk. Hunger labours at the furnace and the plough, coercing the native indolence of man with strenuous and incessant activity. Let food be abundant and easy of access, and civilization becomes impossible; so indissolubly dependent are our higher efforts on our lower impulses. Nothing but the necessities of food will force man to that labour which he hates, and will always avoid when he can. And although this seems obvious only when applied to the labouring classes, it is equally though less obviously true when applied to all other classes, for the money we all labour to gain is nothing but food, and the surplus of food, which will buy other men's labour.

"Hunger, although beneficent, is no less terrible. When its progress is unchecked, it becomes a devouring flame, destroying all that is most noble in man. Hunger is a stimulus to crime, no less than to honest labour. It wanders through dark alleys, whispering desperate thoughts into eager ears; and it maddens the shipwrecked crew till they cast away all shame, all pity, all desire of respect, and perpetrate deeds which cannot be mentioned without horror. Hunger subjugates the humanity in man, and makes the brute predominate. Impelled by this ferocious instinct, men have eaten their companions, and women have eaten their own children. Hunger has thus a twofold character; beside the picture of the activities it inspires, we must also contemplate the picture of the ferocities it evokes."

Again, when speaking of the "causes of hunger," the author thus demolishes a favourite popular theory: "The animal body is often compared with a steam-engine, of which the *food* is the *fuel* in the furnace, furnishing the motive power. As an illustration this may be acceptable enough; but, like many other illustrations, it is often accepted for a real analogy, a true expression of the facts. As an analogy its failure is conspicuous. No engine burns its *own substance* as fuel; its motive power is all derived from the coke consumed; when the coke is exhausted the engine stops. But every organism consumes its own body; it does not burn food, but tissue. The fervid wheels of life were made out of food, and in their action motive power is evolved.

"The difference between the organism and the mechanism is this: the production of heat in the organism is not the *cause* of its activity but the *result* of it; whereas, in the mechanism, the activity originates in, and is sustained by, the heat. Remove the coals which generate the steam, and you immediately arrest the action of the mechanism; but long after all the food has disappeared, and become transformed into the solids and liquids of the living fabric, the organism continues to manifest all the powers which it manifested before."

Not the least interesting points of these volumes are the freedom and skill exhibited by their able author in combating the views of several distinguished physiologists, whose theories have found very general acceptance, derived from what appear to be exact and conclusive experiments. The chemical and physiological theories of Liebig, Marshall Hall, Flourens, Gall, Müller, Cuvier, Spallanzani, Leuwenhoek, and others, undergo, in these pages, various vigorous and keen, though perfectly fair and scientific criticism, showing manifest errors, and a setting to rights of the facts in more strict accordance with modern observations. The author is by no means a mere copyist. He is an original experimenter and thinker. His own microscope and knife open the pathways of investigation, and when he finds a fact opposed to the theories which have been laid down by others, he boldly proclaims it, and reasons therefrom with acumen and ingenuity, and in a style which never fails to interest, and often to captivate.

Where there is so much that is interesting, it is not easy to select any one portion of a volume without apparent injustice to all the rest. We must therefore content ourselves with confidently assuring our readers that the *Physiology of Common Life* will satisfy them, that its author is no ordinary writer or observer; and whether his views find general acceptance or not, he certainly presents and maintains them with remarkable clearness and force. Among the latest, so is he also among the most finished, of the now greatly enlarged number of physiological students, who, *con amore*, delight in delving into the hidden mysteries of nature, and like every true student of nature, he hesitates not to seek aid wherever he can find it, giving ample acknowledgment to all from whom he obtains it. His references are copious, and to our own Dalton and Draper as freely and as often as to any. It is a work destined, we believe, to make a decided mark upon the intelligence of the world, and is to be valued not more for the scientific information it conveys, than for the felicitous *popularization* of its style, whereby its facts are brought home to the comprehension of other readers and students than those of the medical profession.

3. The last work of the series before us, *Studies of Animal Life*, while marked by the same vivacity of style, and abounding in instruction, is yet very different from the work just noticed from the same hand. If we were asked to mention the characteristic most prominent in its pages, we should reply, "Enthusiasm." Though disclaiming the idea which some enthusiastic students have promulgated, that

"The proper study of mankind is *cells*;"

and regarding man as the noblest study, he yet finds under him some other problems which are not to be neglected. Man himself is imperfectly known, because the laws of universal life are imperfectly known. Man forms but the apex of the animal world, and he can only be understood thoroughly by first studying those minuter and obscurer forms, which, though they seldom attract attention, constitute the basis of the pyramid of which he is the apex, and must be conned and made familiar before his biological record can be fully unfolded and comprehended. In the glowing language of our author, "In the air we breathe, in the water we drink, in the earth we tread on, life is everywhere. Nature *lives:* every pore is bursting with life; every death is only a new birth, every grave a cradle! And of this we know so little, care so little! Around us, above us, beneath us, that great mystic drama of creation is being enacted, and we will not even consent to be spectators! Unless animals are obviously useful, or obviously hurtful to us, we disregard them. Yet they are not alien, but akin. The life that stirs within us stirs within them."

With the same design, in many respects, as the work of Dr. Bell before noticed, we are obliged to award to the latter the palm for regularity and system, and a more consecutive method of development of the subject in hand. In fact the variety of topics discussed in this little book of "Studies" of less than 150 pages, is too great to enable an ordinary reader to obtain from it all the satisfaction desired upon any one of them. From the examination of the parasitic animalcule found in the intestinal tube of the frog, which has neither head, nor tail, nor stomach, we are treated to a discussion on the "Fixity of Species," and a biographical sketch of M. le Baron Cuvier, "administrator, politician, academician, professor, dictator," whose simple, ardent, scientific youth, contrasted so widely with his ambitious, political, ceremonious age. Still the ardent lover of nature is traced on every page, and the book is a charming companion, for an evening hour, or a day of summer travel. It is freely illustrated by drawings of microscopic objects, and he tells us, "As a beginning, get a microscope. If you cannot borrow, boldly buy one. Few purchases will yield you so much pleasure; and, while you are about it, do, if possible, get a good one. Spend as little money as you can on accessory apparatus and expensive fitting, but get a good stand and good glasses. Having got your instrument, bear in mind these two important trifles—work by daylight, seldom or never by lamplight; and keep the unoccupied eye *open*. With these precautions you may work daily for hours without serious fatigue to the eye."

Of the numerous anecdotes recited by the author, we quote but one, and this to show the *contagiousness* of the spirit of the seeker of pleasure in the realms of nature.

"Very unintelligible this would be to the passers by, who generally cast contemptuous glances at us when they find we are not fishing, but only removing nothings into a glass jar. One day an Irish labourer stopped and asked me if I were fishing for salmon. I quietly answered 'Yes.' He drew near; I continued turning over the weed, occasionally dropping an invisible thing into the water. At last a large yellow-bellied Triton was dropped in. He begged to see it; and, seeing at the same time how alive the water was with tiny animals, became curious, and asked many questions. I went on with my work; his interest and curiosity increased; his questions multiplied; he volunteered assistance, and remained beside me till I prepared to go away, when he said seriously, 'Och! then, and its a fine thing to be able to name all God's creatures.' Contempt had given place to reverence; and so it would be with others, could they check the first rising of scorn at what they do not understand, and patiently learn what even a roadside pond has of nature's wonders." J. H. G.

ART. XXII.—*Operative Surgery, adapted to the Living and Dead Subject.* By C. F. MAUNDER, Part I. and II., complete, London, 1860–61, 12mo. pp. 318.

THIS work has been published, as the author states in the preface, to satisfy the demand which, while conducting a course of operations on the dead subject in Paris, he found to exist in the English Professional Library, for a concise, systematic, and illustrated guide to the operations applicable as well to the dead as to the living subject.

The volume he has compiled, with this view, is very concise, and it is, in some portions, profusely illustrated; but it is not by any means systematic, and while some few subjects are carefully and fully treated, by far the greater number receive a very insufficient notice.

Considerable experience in courses of operative surgery on the dead body has taught us that three subjects engross almost the whole attention of the teacher; these are, special amputations, the ligation of special arteries, and excision of the joints. These three subjects, and these alone, we have found treated of with proper care in the book before us; and upon all other subjects connected with operative surgery, we must pronounce it to be signally defective.

W. F. A.

QUARTERLY SUMMARY

OF THE

IMPROVEMENTS AND DISCOVERIES

IN THE

MEDICAL SCIENCES.

ANATOMY AND PHYSIOLOGY.

1. *On the Molecular Theory of Organization.* By T. Hughes Bennett, M.D., F. R. S. E.—Parodying the celebrated expression of Harvey, viz., *omne animal ex ovo*, it has been attempted to formularize the law of development by the expression *omnis cellula e cellulâ*, and to maintain "that we must not transfer the seat of real action to any point beyond the cell."[1] In the attempts which have been made to support this exclusive doctrine, and to give all the tissues and all vital properties a cell-origin, the great importance of the molecular element, it seems to me, has been strangely overlooked. It becomes important, therefore, to show that real action, both physical and vital, may be seated in minute particles, or molecules much smaller than cells, and that we must obtain a knowledge of such action in these molecules if we desire to comprehend the laws of organization. To this end I beg to direct attention:—

1st. To a description of the nature and mode of origin of organic molecules.

2d. To a demonstration of the fact that these molecules possess inherent powers or forces, and are present in all those tissues which manifest vital force.

3d. To a law which governs the combination, arrangement, and behaviour of these molecules during the development of organized tissue.

I. By a *molecule* is to be understood a minute body, seen under high magnifying powers in all organic fluids and textures, varying in size from the four-thousandth of an inch down to a scarcely visible point, which may be calculated at much less than the twenty-thousandth of an inch in diameter. Optically it is distinguished according to its size—the smallest presenting dark or light points as the focus is changed, and the larger exhibiting a dark or light centre, surrounded by a distinctly shadowed ring. These last are frequently distinguished by the name of *granules*. The ultimate molecule had never been reached even with the highest magnifying powers. In the same manner that the astronomer with his telescope resolves nebulæ into clusters of stars, and sees other nebulæ beyond them, so the histologist with his microscope magnifies molecules into granules, and sees further molecules come into view. The chemical composition of these molecules must vary infinitely; but I have been in the habit of classifying them into three groups, and referring them to—1. The albuminous; 2. The fatty; and 3. The mineral compounds. These constituents may be mingled together in various proportions so as to produce simple and compound molecules. In the vast majority of cases they are globular in shape; but they may be angular, square, and of various forms. They may differ in size, or be of tolerably uniform size, in the same liquid or substance. They may be regularly or irregularly diffused in the matter examined. Sometimes they are concentrated in particular places, and at others scattered in groups. Their colour is various. Most of the pigments in plants and animals are dependent on the formation of molecules, which in the human lung have been proved to be pure carbon, and in the tissues of plants and animals differently tinted kinds of fat or of wax.

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[1] Virchow, English Translation, p. 3.

These molecules may be formed in two different ways: 1. By precipitation in fluids; 2. By the disintegration of previously formed tissues. The former may be called *histogenetic* (ιστος and γενεσις, *generatio*), and the latter *histolytic* (ιστος and λυσις, *dissolutio*). They may be denominated molecules of formation and molecules of disintegration.

Histogenetic molecules are formed either from the union of two simple organic fluids, or from precipitations occurring in formative fluids, holding various substances in solution. Fourteen years ago I read to the Royal Society of Edinburgh a paper giving an account of the results obtained by a union of oil and liquid albumen, the two organic fluids from which molecular matter is most commonly derived. It was Dr. Ascherson, of Berlin, who first discovered the important fact that the mere contact of oil and fluid albumen caused the latter to coagulate in the form of a membrane, which he called the haptogen membrane, from ἀπτομαὶ, to come in contact. A more complete mixture of two such drops produces, as is well known, a white opaque fluid or emulsion, which in structure exactly resembles milk; that is to say, it consists of molecules composed of a drop of oil surrounded by a layer of membrane of coagulated albumen. Such compound molecules, possessing the property of endosmose, may therefore readily be produced artificially, and by trituration can be reduced in size so as to resemble the elementary molecules in chyle or in the yolk of an egg. If oil and albumen be introduced into the stomach and intestinal canal, they are always so reduced; and one of the objects of digestion would appear to be separating from the food, and rendering fluid its oil and albumen, so as to produce the chyle molecules which are ultimately transformed into blood. Indeed, everywhere in living organisms it may be observed that oil and albumen formed as secretions by plants, and entering the bodies of animals as food, either separately or united, constitute the chief origin of molecular formations.

Mr. Rainey has recently pointed out the condition which causes molecular mineral matter to assume the form of rounded nuclear bodies.[1] This condition is viscosity. If carbonate of lime be dissolved in water, the forms produced on its precipitation are crystalline; but if the fluid be glutinous, composed, for example, of fluid, gelatine, or gum, the forms produced are oval or globular. Precipitations made in this way, on slides of glass, closely resemble the appearances called nuclear or cellular in different stages of development. Mr. Rainey has further shown how starch-granules are produced in the juices of vegetables by the endosmose of gum into a cell containing a solution of dextrine.[2] In the same manner that the contact of oil and albumen produces oleo-albuminous molecules, so does the contact of gum and dextrine precipitate starch-molecules. In this manner we can comprehend how the mixture of various organic fluids gives rise to particles of different kinds.

Histolytic molecules are the result of the transformation and disintegration of fluid and solid substances by chemical or mechanical action. They are generally larger in size than histogenetic molecules, are more purely fatty, and from being associated with the *débris* of broken-down texture may, in most instances, readily be distinguished. Thus, in the breaking up of cells and of muscles when they become fatty, or in the putrefaction of vegetable or animal matters, these may be seen to soften, lose their peculiar structure, break up, and ultimately be reduced to a molecular condition.

We shall subsequently see that these two kinds of molecules are constantly changing places; or, in other words, molecular matter formed from the process of disintegration may, when placed under peculiar circumstances, become the basis of matter which undergoes development. In nature, the breaking down of one substance is the necessary step to the formation of another, and the histolytic or disintegrative molecules of one period become the histogenetic or formative molecules of another. This fact constitutes the basis of the law which I shall subsequently seek to establish.

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[1] On the Mode of Formation of Shells of Animals, of Bone, and of several other Structures, by a Process of Molecular Coalescence, etc. By George Rainey, M.R.C.S. London, 1858.

[2] Microscopical Journal, 1859.

II. These molecules are governed by forces, which induce amongst them a variety of movements, and cause them to combine in definite ways. This force, which we may call *molecular force*, is altogether independent of cell, nucleus, or other form of structure.

1st. There are the well-known molecular movements described by Robert Brown. These vibratile, circular, serpentine, or irregular motions may be observed whenever molecules are suspended in fluids of certain densities, but are too well known to require notice here. They occur altogether independent of organized structures, and must be regarded as in their nature purely physical.

2d. The peculiar movements observed in the interior of cells, vegetable or animal, and during the putrefaction of organic matter. The former are seen in the large vegetable cells of the Chara, Valisneria, and Tradescantia, amongst plants; and those of chyle, the yelk of the egg, and of the salivary cell amongst animals. I have frequently watched the formation of the latter in putrid fluids. A scum, composed of molecules, collects on the surface; gradually several of these unite in minute filaments, more or less long, which assume vibratile or serpentine movements. They are then called *vibriones*. It has been much disputed whether this class of molecular motions be physical or vital.

3d. The movements, which are unquestionably vital, that occur in the molecules of the yelk, on the entrance into the ovum of the spermatozoid. Here it cannot be maintained that the results are purely physical, because in different ova we see such widely-varying effects from apparently the same cause. Neither can it be attributed to any direct influence of the cell or of its nucleus—the germinal vesicle. For example, an egg is fully maturated in the female organs of generation, and would prove abortive if a spermatozoid did not find its way through the zona-pellucida and get amongst the molecules of the yelk. As soon as it does so, the apparently purposeless Brunonian movements receive a new impulse and direction. Both spermatozoid and germinal vesicle are dissolved amongst them; and that wonderful phenomenon of the division of the yelk takes place, not by cleavage or other action of the cell-wall or nucleus, but by the separation of the mass into two masses instead of one. This may be compared to what is observable in a dense crowd of men, called upon to pass over to the right or left hand in order to settle any disputed question by a majority. At first unusual confusion is communicated to the whole; some hurry in one direction, others in another; but, after a time, there is seen at the margins, where the crowd is least dense, a clear space, which gradually approaches the centre, and at length bisecting the whole, produces a complete segregation of the crowd into two portions. So with the molecules of the yelk in the egg after impregnation; their movements are directed by conditions which did not previously exist, and a stimulus is imparted to them which causes the peculiar result. It is the division and subdivision of the yelk, wholly or in part, which produce the germinal mass out of which the embryo is formed, and this not by any direct influence of the cell or nucleus, but in consequence of a power inherent in the molecules themselves, which is communicated to them for a specific purpose.

4th. The peculiar movements so well described by Brücke, Von Wittich, Harless, and especially by Lister, in the pigment-cells of the frog's skin,[1] and which occasion the sudden change of colour in the cameleon, in fishes, and numerous other animals. The black pigment molecules may be diffused throughout the cell or concentrated in a mass, and all kinds of intermediate gradations may exist between diffusion and concentration. The change in colour is owing to these alterations in the molecules, the tint being light when they are concentrated, and dark when they are diffused. Mr. Lister ascertained by experiment that their concentration is caused by exposure to light, by death of the animal, and by sudden section of the nerve going to the skin; while darkness and irritation of the nerve or skin causes diffusion. Sudden amputation of a limb produced at first diffusion, followed by the concentration of death. These movements of the pigment molecules are peculiarly vital, and altogether independent of the cell-wall or nucleus. The cell-wall is stationary, and acts only as a sac or investing membrane around the moving particles, while the concentration of these about the nucleus is purely accidental, and frequently occurs in other parts of the cell. I have seen these molecules myself, as Mr. Lister describes them, streaming out to, and returning from, the circumference under the influence of the stimuli referred to, where no cell nor nuclear action could be thought of.

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[1] On the Cutaneous Pigmentary System of the Frog; Philosophical Transactions, 1858.

5th. There are many other kinds of movements which are evidently independent of cells—for example, those of cilia and of spermatozoids. The former are outside cells, and the latter only move when they are liberated from cells. The contractile fibrillæ of muscle are evidently not dependent for their inherent power on cells or other form of structure, but on the square-shaped molecules of which its substance is composed. All these phenomena, therefore, are connected with the molecules themselves; the force occasioning them is a molecular force, and has nothing to do with pre-existing cells, or supposed germinal centres, as some have imagined.

Again, the power of combination between these molecules, which, under peculiar conditions, not only move, but so move as to advance towards and press upon each other, that they at length unite and produce higher forms, must also be attributed to a molecular force operating in obedience to fixed laws. Thus it was demonstrated by Newton, that in a sphere the total attraction resulting from the particular attraction of all its component parts is, as regards any body drawn towards it, the same as if they had been concentrated at the centre. Hence minute spherical particles, as so many gravitating points, will be drawn towards each other with a force varying inversely as the squares of the distances between their respective centres. I may here refer to the able descriptions of Mr. Rainey,[1] as to the physical laws regulating the formation and disintegration of bodies by molecular attraction and repulsion as well as to the effects of molecular superposition, showing that the same physical power which leads to the formation of these artificial bodies, when long continued, causes their disintegration and destruction. All these changes occur slowly, and require time; but their contemplation, when regarded as purely physical phenomena, must strike us with surprise, as being closely allied to all our conceptions of the progress of life itself.

In making use of the expression *life* and *vital action*, I am only using terms to indicate phenomena which, in the present state of science, cannot be accounted for by the ordinary laws of physics. Or it might be said that certain actions are directed and governed by conditions which are as yet undetermined, but which, as they only occur in organic, as distinguished from inorganic bodies, constitute vital actions. Not that an organized body is independent of physical forces, but that certain directions are communicated to them, which, as invariably resulting in specific forms or properties, make up the sum of what we call vitality.

Hence, although we see molecules combining in the forms of crystals and nucleated spherules, inasmuch as we have discovered the physical conditions on which they depend, and can produce them artificially, we have no difficulty in classifying these amongst purely physical phenomena, even when they occur in the interior of animals. But when other molecules unite to form nuclei, cells, and fibres, and these arrange themselves into tissues and organs to produce plants and animals, we are ignorant of the conditions by which these results are brought about—we cannot imitate them artificially, and are content to call them vital. But the fact I am anxious to point out is this, that so far as observation and research have enabled us to investigate this difficult matter, it appears that the formations and disintegrations of vegetables and animals, as well as the peculiar properties they exhibit, are essentially connected with the molecular element. Thus, when we investigate the functions of plants and animals—for example, generation, nutrition, secretion, motion, and sensation—we find them all necessarily dependent on the permanent existence and constant formation of molecules.

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[1] *Op. cit.* See also papers in the Microscopical Journal, 1860.

Thus generation, both in plants and animals, is accomplished by the union of certain molecular particles called the male and female elements of reproduction. Amongst the Protophyta the conjugation of two cells enables their contents, or the endochrome, to mix together. This endochrome is a mass of coloured molecules, and the union of two such masses constitutes the essential part of the generative act. In the Cryptogamia, a vibratile antheroid particle enters a germ-cell, and finds this last filled with a mass of molecules, which, on receiving the stimulus it imparts, assumes the power of growth. It is the same amongst the Phanerogamia, when the germ-cell is impregnated by the pollen tube. In all these cases it is necessary to remember that the protoplasm is a mass of molecules; that a spore is another mass of molecules; that sporules are molecules; that antherozoids are only molecules with vibratile appendages; and that the so-called germinal matter of the ovule is also nothing but a mass of molecules. Cell-forms are subsequent processes, and once produced may multiply endogenously, by gemmation or cleavage; all that is here contended for is, that the primary form is molecular, and that the force-producing action in it is a molecular force.

In animals, as in vegetables, every primary act of generation is brought about by the agency of molecules. The *Protozoa* entirely consist of mere molecular gelatiniform masses, in which it has never been pretended that a cell-wall or central cell exists. And yet such masses have the power of independent motion, and of multiplying by gemmation. Considerable discussion has occurred as to whether, among *Infusoria*, there is a union of sexes or a conjugation similar to what occurs among the *Protophyta;* but, in either case, it is by molecular fusion that the end is accomplished. In the higher classes of animals there are male elements, consisting of molecules, generally with, but sometimes destitute of, vibratile filaments, and female elements, composed of the yolk within the ovum, containing a germinal vesicle or included cell. Both spermatozoid and germinal vesicle are dissolved in the molecules of the yolk, which then, either wholly or in part, by successive divisions and transformations, constitute a germinal mass out of which the embryo is formed. Here, as in plants, it is necessary to remember that the spermatozoids, the yolk, and the germinal mass, are all composed of molecules, and that these, combining together, form the nuclei, cells, fibres, and membranes, which build up the tissues and organs of the organism. It is not from either the male or the female element that the embryo is formed. The supporters of an exclusive cell-doctrine have endeavoured to show that there is always a direct descent either from the wall of the ovum or from the germinal vesicle as its nucleus. Thus some consider that the vitelline membrane sends in partitions to divide the yolk mechanically. Others have formed the idea that the germinal vesicle bursts, and that its included granules constitute the germs of those cells which subsequently form in the germinal mass. Others, again, suppose that on impregnation the germinal vesicle divides first, and that the molecules of the yolk are attracted round the two centres so formed. But numerous observations have satisfied me that both spermatozoid and germinal vesicles are simply dissolved among the molecules of the yolk, from the substance of which, stimulated and modified by the mixture so occasioned, the embryo is formed; a view which has further the merit of explaining what is known of the qualities of both parents observable in the offspring. I am only acquainted with one exception to this general law—namely, the development of *Pyrosoma*, recently described by Mr. Huxley, the description of which, however, is incomplete. The truth appears to be, that in an analogous manner to that in which the pigment molecules of the skin are stimulated by the access of light to enter into certain vital combinations with one another, so are the molecules of the yolk stimulated by the access of the spermatozoid to produce those other vital combinations that result in a new being.

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[1] Annals of Natural History, Jan. 1860, p. 35.

The essential action is not so much connected, as has hitherto been supposed, with the cell-wall or nucleus as with the molecular element of the ovum.

With regard to nutrition; food and all assimilable material must be reduced, in the first instance, to the molecular form, while the fluid from which the blood is prepared, viz., chyle, is essentially molecular. Most of the secretions originate in the effusion of a fluid into the gland-follicle, which becomes molecular, and gives rise to cell-formation. In muscle, the power of contractility is inherently associated with the ultimate molecules of which the fasciculus is composed; and, lastly, the gray matter of the sensory ganglia, and of the brain, which furnishes the conditions necessary for the exercise of secretion, and of even intellect itself, is associated with layers of molecules which are unquestionably active in producing the various modifications of nervous force. These molecules are constant and permanent as an integral part of these tissues, as much as cells or fibres are essential parts of others, and their function is not transitory, but essential to the organs to which they belong.

All these facts point to the conclusion that vital action, so far from being exclusively seated in cells, is also intimately associated with the elementary molecules of the organism.

III. This leads me, in the third place, to an enunciation of the molecular law of growth, which a study of the numerous facts previously referred to had induced me to frame, viz:—*That the development and growth of organic tissues are primarily owing to the successive formation of histogenetic and histolytic molecules.* We have already seen that development and growth in animals originate in the molecules of the yolk of the egg, or of a germinal molecular mass formed from it. From numerous careful researches recognized by scientific men as giving a correct account of the development of various animals and textures, it would appear that the first form is molecular; that the molecules unite to produce nuclei and cells; that these become disintegrated to produce a secondary mass of molecules; that these again unite to form secondary nuclei and cells; and that the same process is repeated more or less often in various developments, until the animal or tissue is formed. This constitutes the successive histogenetic and histolytic molecules observable in the process of growth; the former building up, to a certain extent, and the product disintegrating to produce the latter, which, after a time, again rearranges itself, and becomes histogenetic to form cells or tissues, which, in their turn, break down and become histolytic. In short, not only development, but growth and secretion, absorption and excretion, are only different names given to histogenetic and histolytic processes, and these are brought about by formative and disintegrative molecules. As illustrations of this law, I may refer to the development of *Ascarix mystax*, as described by Nelson[1], and of the process of nutrition in the human body.

In this, and a vast number of similar observations, it must be evident that a certain series of molecular transformations is necessary for the one which follows it. Thereby is produced a continual elaboration of matter—a constant chemical and morphological series of changes—the exact number and order of which, in the production of organic forms, only require time and perseverance to discover. Doubtless, various conditions, dynamical, chemical, and vital, must co-operate in producing the result, and they must all influence molecular as well as every other kind of combination. Such considerations and facts must convince us of the error of endeavouring to place the source of special vital action in any particular form or arrangement of organic matter, whether fibre, cell, nucleus, or molecule. Each and all of these elements have their vital endowments, which reoperate on the others. But, inasmuch as the molecular element is the first as well as the last form which organized matter assumes, it must constitute the principal foundation of organization itself.

It is not my object, in directing attention to a molecular theory of organization, to interfere in any way with the well-observed facts on which physiologists have based what has been called the cell-theory of growth. True, this last will require modification, in so far as unknown processes of growth have been hypothetically ascribed to the direct metamorphosis of cell elements. But a cell once formed may produce other cells by buds, by division, or by proliferation, without a new act of generation, in the same manner that many plants and animals do, and this fact comprehends most of the admitted observations having reference to the cell-doctrine. The molecular, therefore, is in no way opposed to a true cell-theory of growth, but constitutes a wider generalization and a broader basis for its operations. Neither does it give any countenance to the doctrines of equivocal or spontaneous generation. It is not a fortuitous concourse of molecules that can give rise to a plant or animal, but only such a molecular mass as descends from parents, and receives the appropriate stimulus to act in certain directions.

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[1] Phil. Trans., 1850, pl. xxviii. xxix. figs. 59, 68, 70, 78.

In conclusion, the theory I have endeavoured to establish on histological and physiological grounds, is fully supported by all the known facts of disease and of morbid growths, which further serve to show that pathology, so far from being cellular, is, in truth, molecular.—*Proceedings of Royal Society of Edinburgh*, April 1, 1861.

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2. *Pulmonary Osmosis.*—The frequent coincidence of diabetes and pulmonary tubercles has led Mandl to perform experiments on the influence of solutions of sugar and some other sweet substances (cane sugar, glucose, sugar of milk, glycerine, and mannite) on various species of aquatic animals, as infusoria, annelida, crustacea, water-insects, fishes, and batrachia. The results are: 1. That all aquatic animals perish in solutions of sweet substances; there is, however, a difference as to the time of death, depending on the degree of concentration of the solution, on the quality of the substance contained in the solution, and on the species of animal. Thus, the infusoria died almost instantaneously in solutions of 20 per cent. of cane sugar, glucose, glycerine, and mannite, but lived about five minutes in a concentrated solution of sugar of milk; they died after six or eight minutes in a solution of 4 per cent. of mannite, while they lived three times as long in a solution of equal strength of cane sugar. Some fishes (12 to 15 centimetres long) perished in a solution of glycerine of 10 per cent. after about forty minutes; in a solution of cane sugar of the same strength only at the end of four or five hours. 2. That the death is not caused by a chemical action of these substances, or by fermentation, or absence of air, or by the viscosity of the fluid, but only by the osmotic action (endosmosis and exosmosis) exercised by the solutions of the sweet substances. 3. That this osmotic process takes place through the permeable membranes, and especially through those of the respiratory organs. The not fermentable sweet substances possess a greater osmotic power, and act also more rapidly on the life of the animals. 4. Experiments made with animal membranes, to demonstrate which of the elements of the blood pass over into the solution of sugar, have shown that the first to pass over is water charged with the salts of the serum, after which follows albumen, the colouring matter being the last. The passage of the albuminous substances is retarded by greater concentration of the osmogenous substance. Mandl promises to communicate in another paper the results of his injections of solutions of sugar into the respiratory organs, with regard to the formation of tubercles of local nature, in opposition to the tubercles resulting from the tubercular diathesis. In the present essay, the author points out how the osmogenous power of sugar explains various physiological and pathological phenomena, as the sensation of thirst after the ingestion of sugar; the antiseptic power of sugar; the digestive property of small quantities of sugar, causing exosmosis of gastric juice; the absorbing power of large quantities of sugar in dropsies; the great thirst of diabetic individuals; the impossibility of serous effusions in such patients. To the great osmotic action of the glycerine, the author ascribes also the influence of this substance as a local remedy.—*Brit. and For. Med.-Chir. Rev.*, July, 1861, from *Comp. Rend.*, vol. i. 1860, and *Arch. Gén. de la Méd.*, vol. ii.

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3. *Death by Submersion.*—Dr. Beau has performed on dogs several series of experiments, to elucidate the cause of death by submersion, especially with the view to explain the fact, that the air-passages of drowned animals contain only a very small quantity of fluid. The inference is, that the immersion of the

natural orifices of respiration causes, "by sympathetic or reflex action, spasmodic occlusion of the sphincters or orifices of respiration, and stopping of respiratory movements." The death from drowning, the author argues, is therefore analogous to that from tetanic affection of the muscles of respiration. The two principal experiments are, that of two animals, in whose opened trachea a canula has been inserted; the lungs of the one which had been entirely submerged under water contain only the usual small quantity of frothy fluid; while the air-passages of the other, whose head had been kept out of the water, are filled with that fluid.—*Brit. and For. Med.-Chir. Rev.*, July, 1861, from *Comp. Rend.*, vol. i. 1860.

4. *Modes of Death from Chloroform.*—Much difference of opinion exists as to the nature of the death of those in whom chloroform has proved fatal. Whether death is due to syncope or to apnœa; to paralysis of the circulation or of respiration, or whether either may be the cause of death, is still a mooted question. Dr. A. E. SANSOM states, as the result of his investigation, that either of these may be the cause of death. He observes (*Lancet*, Aug. 24, 1861) "all the vital functions in etherization are depressed by an altered blood. What link is first snapped asunder in fatal cases is determined by various causes. In animals respiration fails first because the automatic power of their hearts enables its movements to persist. In man, circulation usually first fails because the heart is the most susceptible of the incomplete stimulus. In animals death occurs by asphyxia, and death begins in the brain. In man, death occurs by syncope or by asphyxia, and death begins in the brain, in the heart, or in the lungs. Practical men may learn a useful caution from this; for it has been said, that in cases of danger the pulse is to be disregarded, and the embarrassment of the breathing taken as the critical sign. If I may be permitted to express dogmatically what I have learnt by experience, I would say: Rely almost wholly on the pulse. Disregard dyspnœa if the pulse be good; but if the pulse show signs of failing, withdraw the chloroform, and consider the condition a condition of danger.

MATERIA MEDICA AND PHARMACY.

5. *Rules for the Administration of Chloroform.*—Dr. W. MARCET has published (*Med. Times and Gaz.*, July 20, 1861) some interesting practical observations on the action of chloroform.

"When chloroform," he observes, "is inhaled, and consequently brought into contact with the air-cells of the lungs, it passes rapidly into the blood, by means of which it is carried to the brain. If the administration of the anæsthetic agent be suspended, the chloroform will be eliminated from the body by the respiration, each inspiration displacing most of the vapour contained in the blood exposed by the lungs to the action of air during that inspiration. The elimination from the blood of any very volatile substance possessed of a stable chemical composition may be considered, as a rule, to take place through the lungs. This might have been anticipated by a consideration of the displacement of the carbonic acid of the blood by the air inspired, and has been placed beyond doubt by a well known beautiful experiment of Claude Bernard, where an aqueous solution of sulphuretted hydrogen being injected into the blood of a dog, the animal in the course of one or two minutes expires the whole of the poisonous gas. Messrs. Lallemand, Perrin, and Duroy have shown experimentally that this law is applicable to chloroform, and consequently there is not the slightest doubt that when blood contains chloroform it is removed therefrom by means of respiration.

"If the air inspired be pure, the displacement of chloroform from the blood in the lungs will be very great; if this air should contain chloroform the displacement will be less, just as when air containing a large proportion of carbonic acid is breathed, the removal of the carbonic acid of the blood is checked. When a patient begins to inhale chloroform, a portion is absorbed by the blood, the remaining is expired; but shortly afterwards, in addition to the expiration of that part of the chloroform, which has not been taken up by the blood, a certain quantity of that which has been absorbed is also ejected, being displaced by the air mixed with the chloroform inhaled. At this stage, however, there is still an accumulation of the anæsthetic agent in the blood, more being taken into the circulation than given out; gradually complete insensibility is produced, and the handkerchief is removed from before the face of the patient; he now begins ridding himself rapidly of the chloroform, and recovers consciousness, unless more of the anæsthetic agent be exhibited. By the careful administration of chloroform the state of insensibility may be kept up for a considerable length of time; during this period it is obvious that the accumulation of the vapour in the blood no longer takes place, otherwise it would invariably produce death, there must consequently be an equilibrium between the quantity of chloroform absorbed, and that which is displaced and eliminated by the process of respiration. If, during this stage of insensibility from any cause whatever, the power of absorption of the blood for chloroform be suddenly increased, or its property of giving it out to the air inspired be diminished, then death will take place from an accumulation of the vapour in the blood. It is difficult to imagine that the power of blood of absorbing the substance under consideration should be suddenly increased; but there is a very simple cause impairing its elimination from the blood, viz., the administration of the chloroform vapour in too concentrated a condition. Just as an excess of carbonic acid in the air prevents or interferes with the elimination of that contained in the blood, so must an excess of chloroform in the air prevent or interfere with the exit of chloroform already existing in the blood; therefore, the blood goes on taking up chloroform, and giving out less than a quantity equal to that absorbed, at the same time the evil may be increased by a few deep inspirations taken unconsciously, although apparently with the view of ejecting the poison, and life is suddenly extinguished."

These observations lead him to the following conclusions:—

"1. That chloroform must be administered cautiously, and its effects watched with particular attention, if, although the vapour be freely inhaled, the patient does not become insensible within the usual time.

"2. That in every case where chloroform is administered, as soon as the state of insensibility is obtained, the vapour must be exhibited diluted as much as possible with pure air; and air free from the anæsthetic agent ought to be allowed frequently into the lungs to remove the excess of the vapour present in the blood.

"3. That during the administration of chloroform great attention should be paid to the state of the respiration, which ought to guide the exhibition of the anæsthetic agent still more than the condition of the pulse. If the inspirations become less deep and respiration appear failing, air free from chloroform ought to be immediately allowed into the lungs, not only because this state of the respiration is an indication of there being an overdose of chloroform in the blood, but also because the diminished respiration is in itself a cause of danger by preventing the blood from ridding itself of the chloroform it contains.

"4. That when a patient has sunk under the effects of poisoning by chloroform the only means of restoring animation is by artificial respiration, adopting such method as is best calculated to introduce as much air as possible into the lungs in order to remove the poison from the blood, at the same time stimulating the action of the heart.

"It is due to Messrs. Lallemand, Perrin, and Duroy to state that they have already called attention to the importance of looking closely to the respiration during the administration of chloroform; but these gentlemen have overlooked the fact that the presence of an excessive proportion of chloroform in the air inspired must act more or less as an obstacle to the elimination of the vapour which has already been absorbed—a circumstance which ought to be taken into consideration on every occasion where chloroform is exhibited."

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6. *Internal Administration of Chloroform.* By M. Bonnet and Dr. Debout.—In consequence of the difference in density between chloroform and water, it is rather difficult to administer the former drug as an internal remedy,

because it falls to the bottom of the bottle and can only be suspended by continual shaking. M. Bonnet has therefore proposed to employ glycerine as a medium for the administration of chloroform. Equal parts of chloroform and glycerine are poured into a mortar, and the mixture is rubbed up gently until no more drops of chloroform can be perceived; then the distilled water or other adjuvant is added, and a very limpid mixture is obtained, not exhibiting the slightest trace of chloroform in the free state. The glycerine should be quite pure—that is to say, it ought to be carefully freed from organic matters, fatty volatile acids, a little sulphuric acid, and certain salts, with which it is often adulterated in commerce. Dr. Debout approves the suggestion of M. Bonnet as to the mixture of chloroform with glycerine, but he recommends that the proportions of the two should be different. Dr. Debout's formula consists of thirty grammes of glycerine and two grammes of chloroform, a teaspoonful for a dose in a glass of water. The dose of chloroform thus taken amounts to twelve drops.—*Brit. and For. Med.-Chir. Rev.*, July, 1861, from *Bull. Gén. de Thérap.*, April 15, 1861.

7. *On the Operation of Aniline upon the Animal Body.*—Dr. SCHUCHARDT made a series of experiments to prove the effects of aniline upon animals. Aniline is an oily liquid, of powerfully basic properties, obtained by the distillation of indigo, and the name aniline is derived from the specific name of indigo-plant (*Indigofera anil*). The physiological properties of aniline are but little known, but the researches of Dr. Schuchardt prove that it is a poisonous substance. The results at which he arrived are the following: Aniline may act injuriously on the animal organism, and in large doses may even cause death. Frogs introduced into a weak solution containing aniline died in periods varying from a quarter of an hour to two hours and a half, and death was also caused by the introduction of aniline into the mouth or into a wound in the back. Rabbits were also poisoned by this substance, a small animal being killed by fifty drops in six hours and a quarter, and a larger one by one hundred drops in four hours. In all the animals experimented upon, violent clonic and tonic spasms ensued after the application of the aniline, and continued almost uninterruptedly until death. There was also loss of sensibility, commencing at the lower extremities and extending to the upper, and the temperature of the body was also reduced. Wherever the aniline was applied locally, as in a wound of the back, on the stomach, on the posterior part of the tongue, or on the conjunctiva, appearances of irritation were observed, which are probably connected with the power possessed by aniline of coagulating albumen. The aniline was never detected in the urine, and it is probable that this substance is eliminated from the body rather by the organs of respiration than by the kidneys.—*Brit. and For. Med.-Chir. Rev.*, July, 1861, from *Archiv für Path. Anat. und Physiologie*, 1861.

8. *On the Physiological Action of Santonine and of the Seeds of Artemisia Contra.*—Santonine is an organic principle obtained from the *Artemisia contra*, and possesses vermifuge properties, but its operation has only recently been minutely studied. Dr. EDMUND ROSE, of Berlin, has taken it himself, in the dose of a gramme (about fifteen grains), without injury. Its taste is bitter, very disagreeable, and persistent, and it is slightly diuretic, but rather confines the bowels. It produces a peculiar and indescribable narcotic effect, and causes a species of colour-blindness, tinging all the objects seen with a yellow hue. The essential oil of *Artemisia contra* is poisonous; it kills rabbits in the dose of about two grammes, producing convulsions which descend from the head to the lower extremities, followed by ascending paralysis. This oil is not vermifuge, for in medicine and medicinal doses it is absorbed in the stomach and the upper part of the small intestines, and does not reach the lumbrici, which generally exist lower down; in larger doses it is poisonous. Santonine, on the other hand, is a good vermifuge; it is innocuous, and traverses the whole of the digestive canal, and is found in large quantity in the fecal matters, for it is almost insoluble in water, and a small part only is transformed into soluble santonate of soda, after contact with the bile, and it is santonine which most rapidly de-

stroys the worms. Santonate of soda ought not to be substituted for santonine, as has sometimes been recommended, for it possesses no superiority over the latter, and is besides of a more disagreeable taste, and is poisonous in large doses.—*Brit. and For. Med.-Chir. Rev.*, July, 1861, from *Archiv für Path. Anat. und Physiologie, &c.*, 1860.

9. *Therapeutical Employment of the Sulphate of Alumina and of the Sulphate of Alumina and Zinc.*—The sulphate of alumina (which is not to be confounded with the common alum, a double sulphate of alumina and potash) was introduced into medical practice by Dr. HOMOLLE. It contains an excess of acid, a small portion of iron, and a little of the double sulphate; and in order to neutralize the free acid, which may burn the linen of the patients and injure the steel instruments of the surgeon, M. Homolle has proposed to add oxide of zinc, thus forming a double sulphate of alumina and zinc. This latter has a more energetic action on heteromorphous tissues than the simple sulphate, and M. Homolle prefers it when it is desirable to apply it to a deep portion of altered mucous tissue, or to destroy an accidental growth. The affections in which it has been successfully employed are inflammations of the tonsils and pharynx, hypertrophy of the tonsils, polypus of the nasal fossæ, ingrown finger-nail, scrofulous ulcers, nævi and vascular growths, inflammatory affections of the neck of the uterus, displacements of that organ, and lastly, cancerous ulcers. In many cases where the tonsils were so much hypertrophied as apparently to require excision, M. Homolle has observed the chronical enlargement to yield to the daily use of the saturated solution of the simple sulphate of alumina. Membranous diphtheric sore-throat, before the larynx was attacked, yielding to the same application, and in a case of polypus of the nasal fossæ, where the morbid growth had sprouted out several times after removal, the patient was finally cured by the same agent. Scrofulous ulcers, touched every day with the sulphate of alumina, began to assume a healthy appearance, their fungous growths being reduced and the cicatrization being promoted; and hypertrophic engorgement of the neck of the uterus, and erythematous, granular, or ulcerous inflammation of its lips, was rapidly improved or cured by the direct application of the double sulphate with the addition of injections of the same salt. In its direct action it favours the exfoliation of the morbid tissue in successive layers; it diminishes the ichorous discharge of the ulcerated surface, destroys the smell, and causes the secretion to resemble healthy pus, and diminishes or completely removes the lancinating pains which are peculiar to cancer. M. Homolle's conclusions, in reference to the use of the sulphate of alumina and the double sulphate of alumina and zinc, are the following:—

1. These salts, used externally, may be ranked as modifying agents, occupying a place between catheretics and caustics. 2. They are particularly useful in inflammations of the tonsils and pharynx, and in the affections of the neck of the uterus; and 3. They possess, moreover, a special remedial power over cancerous ulcers, the progress of which they retard or modify, acting in this respect at once as caustics, disinfectants, and hæmostatics. They often succeed better than narcotics in relieving the pain peculiar to cancer, and they retard the development of the attendant cachexia.—*Brit. and For. Med.-Chir. Rev.*, July, 1861, from *Bull. Gén.de Thérap.*, March 30, 1861.

10. *Employment of Cajeput Oil.*—M. DELVAUX, after giving a historical statement of the therapeutical employment of this substance, next furnishes an account of his own experience of its use when combined with passive substances, admitting of its properties being readily judged of. He has found it of great use in advanced and painful dental caries. A drop or two is inserted into the cavity and retained there by some cotton which had been dipped in the oil. After some minutes a sense of cold and numbness ensues, and the pain rarely resists. Essential dyspepsia, accompanied by intestinal flatuosity is treated with success by the oil. A tablespoonful of a mixture of two or three parts of the oil with 160 parts of mucilage and 30 of syrup may be given every hour, or a pill containing half a grain of the oil mixed up with magnesia may be substituted. The meteorism met with in severe diseases may be combated by an em-

brocation formed of equal parts of olive and cajeput oils. In algid cholera the oil is quite useless, but this is not the case in cholerine, or the disturbance of the digestive organs which so often precedes the cholera. A great number of such cases, when the pulse has been small, feeble, and slow, have been treated advantageously by the following mixture, aided by low diet and tepid drinks: ℞.—Mucilage 140, cajeput 3, syrup 30 parts. A tablespoonful, first every quarter and then every half hour. It is usefully employed for the expulsion of ascarides, either as an electuary made with honey (1, 2, or 3 parts to 60), or as an enema, one part being mixed with 30 of distilled water by means of yelk of egg. In chronic affections of the respiratory organs, as laryngitis, bronchitis, slow phthisis, accompanied by asthenia, the cajeput leads to a diminution of the dyspnœa and cough, and an easier expectoration while the appetite returns. It is of use in nervous palpitation. In two cases it was given in doses of from 15 to 45 grains in the 24 hours. In chronic vesical catarrh, the oil without curing the disease gives rise to great amendment by facilitating the emission of urine and diminishing the production of mucosities. As to its employment in rheumatism, M. Delvaux has always found it without effect while acute inflammatory action has been present. In the chronic articular rheumatism, when the pain and swelling are slight and the colour of the skin is normal, it is always useful, employed internally and by friction; but when the affection is attended with much swelling, or by deformity, or tophus, it is of no avail. In chronic myorheumatism and endorheumatism it is always of great service; while in epicranial rheumatism, in which the fibro-muscular layer of the cranium is affected, it has often effected a complete cure after numerous other remedies have failed. The same good effects have attended its employment in chronic pleurodynia and lumbago. For the muscular rheumatisms observed in those who have been exposed to the fatigue of prolonged voyages or residence in hot and humid climates, which are attended with emaciation, and in which digestion has become difficult, painful, or even impossible, in consequence of the fibro-muscular portions of the digestive canal having become involved in the rheumatism, cajeput proves a true specific, the pain disappearing under its influence and the patient recovering his health. In various *affections of the skin* this remedy is very efficacious, as acne rosacea, pityriasis, and psoriasis. In acne rosacea the oil must be applied over the whole diseased surface by means of a pencil three times a day, placing the patient in the horizontal posture lest the vaporization irritate the eyes. The epidermis scales off and the close network of vessels becomes atrophied, so that in persons with fresh complexions the skin to which the oil has been applied becomes whiter than that of the rest of the face. Furfuraceous desquamations of the scalp, eyelids, and beard, may be successfully treated by ointments containing the oil, and patches of psoriasis may be treated by imbibing them with the oil. This soon excites sharp inflammation and suppuration of the dermis, which excites a modifying influence upon the skin. The oil must then be replaced by soothing topical applications. Cajeput prevents the fall of the hairs, and favours their reproduction in alopecia when there is atony of the dermis or bulbs. It has proved especially useful in cases in which the eyelashes have fallen after having been dyed. In the painful atony of a joint with tumefaction and œdema met with after *sprain*, especially when the starch bandage has been used, frictions with embrocations of olive and cajeput oils soon re-establish the vigour of the part.—*Med. Times and Gaz.*, Aug. 17, 1861, from *Presse Médicale Belge*, 1861, Nos. 12, 13, 17, 23, 25, 30.

11. *Preparation of a Stearate of Iron in the Treatment of Phagedenic Chancres.*—For some months M. RICORD has employed an ointment and an adhesive plaster of stearate of iron, which appears to be a valuable agent for dressing chancres which are complicated with phagedena. This new therapeutical agent was employed for the first time on a patient who had been the subject of experiments in syphilization, and who had, when he came under M. Ricord's care, his thighs covered with phagedenic ulcerations, which had been treated without success by several able practitioners. M. Ricord conceived the idea of making use of an adhesive plaster of stearate of iron, with which he dressed the ulcerations on the right side, and dressings, by way of comparison,

were applied on the left side with adhesive plasters of coal-tar. In a short time the phagedenic ulcerations on the right side were completely cicatrized, and in consequence of this remarkable result, the coal-tar plaster was replaced by one of stearate of iron, which effected a perfect cure in less than a month. The ointment of stearate of iron is made by mixing together a solution of sulphate of iron with a solution of Marseilles soap, drying the precipitate and then melting it, and finally adding some essence of lavender, taking care to stir until the mass has completely cooled. The adhesive plaster of stearate of iron is made by taking the stearate prepared as above described, melting it at a gentle heat, and spreading it upon linen as in ordinary plasters.—*Brit. and For. Med.-Chir. Rev.*, July, 1861, from *Bull. Gén. de Thérap.*, May 30, 1860.

12. *Remedies for Tape-worm in Abyssinia.* By Dr. Courbon.—The remedies for tape-worm stand at the head of the Abyssinian Materia Medica, and they are perhaps the only remedies that the Abyssinians are acquainted with, and that are really useful to them. Among these remedies, the kousso and mesenna must be ranked first, and afterwards the fresh bark of the pomegranate, the habi-tsalim, habi-tchogo, belbelta, and soaria. The *kousso* is furnished by a rosaceous plant of the tribe of the spiræas, and approximating to the genus agrimonia, and is called the *Brayera anthelmintica.* This is a beautiful diœcious tree, terminated above by a bunch of leaves, and with long, pendant bunches of flowers. The latter are the parts employed, and the dose is a handful. The Abyssinians reduce the kousso into a coarse powder, and swallow it mixed with water. An hour after taking it, there is an ordinary evacuation, and half an hour or an hour later there is a liquid motion, and at the end of three, or sometimes four or six hours, the tænia is expelled in the form of a whitish ball. The Abyssinians swallow the kousso fasting, and take no food until after the expulsion of the tænia, but afterwards they drink and eat abundantly, and use the most exciting kinds of food and drink. The *mesenna*, another remedy for tape-worm, was once supposed to be obtained from the *Juniperus procera*, but it is really the product of a leguminous plant, the *Albizzia anthelmintica*, a tree of some three or four feet high, with a thick and very rugous bark. The latter is the part used in medicine. The Abyssinians take it in various ways, but they always employ the powdered bark in the dose of about sixty grammes. They mix it with water, or they make it into bread with flour, or they incorporate it with butter or honey, so as to form a kind of bolus, which they swallow. The consequence is, that on the evening when the drug is taken there is a semi-solid motion, in which there are some fragments of the worm. It is only on the next day and the following days that the rest of the tænia is expelled in sero-mucous evacuations. The mesenna is said to be the best remedy for tape-worm, and completely expels this parasite from the body. The *habi-tsalim* is obtained from two kinds of jasmine—the *Jasminum Abyssinicum* and the *J. floribundum*—and the leaves are the parts employed, mixed with the young shoots of the *Olea chrysophylla*, a kind of olive. A handful of this mixture is pounded very carefully between two stones, with the addition of a little water, and thus a kind of liquid paste is obtained and swallowed by the natives. It is said to be very efficacious in expelling the tænia. The *habi-tchogo* is now proved to be the *Oxalis anthelmintica*, a handsome plant with a subterranean stem, terminated by an oval bulb of the size of a chestnut. The bulbs are the parts employed, in the dose of sixty grammes or more; the Abyssinians eat them by handfuls like small onions, or bruising them on a stone, they mix them with fluid, and drink the juice after it has been strained through them. The *habi-tchogo* is said to be almost as efficacious as the kousso. The *belbelta* belongs to the family of *amarantaceæ*, and is said to be obtained from the *Celosia adoensis*. According to Schimper, the leaves, flowers, and fruits are employed for the tænia; but MM. Ferrel and Galinier state that it is the powdered seeds which are used. The *soaria* is a small shrub belonging to the family of the *Myrtaceæ*, and is the *Mœsa picta*. The part employed is the fresh fruit, or the same part dried. The *roman* is the native name of the *Punica granatum*, or pomegranate. In Abyssinia, as in Europe, the bark of the root is the part employed, but it is rarely used. Among all these remedies for tape-worm, the

kousso, the mesenna, and the habi-tchogo are almost the only anthelmintics employed by the Abyssinians.—*Brit. and For. Med.-Chir. Rev.*, July, 1861, from *Bull. Gén. de Thérap.*, April 30 and May 15, 1861.

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13. *Ergot of Wheat.*—Some of the practitioners at Claremont-Ferrand, in Auvergne, have of late substituted the ergot of wheat for that of rye with advantage. It is larger, rounder, and harder than the rye, and its odour is less disagreeable. Attracting moisture also far less than the ergot of rye, it retains its activity after being powdered for a longer period.—*Med. Times and Gaz.*, July 20, from *Gaz. Hebdom.*, No. 28.

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14. *Ferri Carbonas Effervescens.*—Dr. THOMAS SKINNER, of Liverpool, believing that the proto-carbonate of iron is one of the best of the chalybeates, thought it desirable to obtain it nascent, and in a soluble form, and recommends for this purpose the following formula:—

R.—Acidi tartarici ℥iij; Sodæ bicarbonatis ℥v; Ferri sulphatis ʒx; Pulveris sacchari ʒj; Acidi citrici ʒij.

1. Mix the sulphate of iron with the sugar and part of the tartaric acid. 2. Mix the citric acid with the remainder of the tartaric acid and the bicarbonate of soda. 3. Add the mixtures, and thoroughly incorporate them by sifting. 4. The whole is now to be thrown into a metallic pan set in a water bath; in a few minutes it will separate, when it should be rapidly stirred until granules are formed. If preferred, it may then be flavoured with the oil of lemon; hitherto, however, the preparation has been without it.

Physical and other Properties.—When the above is carefully prepared, it has all the appearance of the popular and well known granular effervescent citrate of magnesia, with the addition of a slight yellowish green tint. Every drachm and a half contains ten grains of sulphate of iron, which, with a complement of bicarbonate of soda, is certain to produce, in a state of solution, four grains of nascent protocarbonate of iron. At the same time, there is developed a tartrate with a little citrate and sulphate of soda, which is, if anything, an advantage, as they act the part of a very gentle saline aperient, obviating the usual astringent effect of preparations of iron, as well as the too frequent constipation attending cases requiring chalybeates, particularly amongst females. The taste of it depends very much upon the amount of dilution. When taken in the dose and manner hereinafter recommended, the taste is that of a mild, sparkling, and refreshing chalybeate.

After the effervescence subsides, a perfectly clear, light-green solution remains, which, if allowed to stand for some time, becomes of a deeper green colour on the surface, gradually increasing from above downwards, and floating like a cloud upon the upper stratum of the liquid. This appearance was at first mistaken for oxidation, but the more correct explanation seems to be that it is the carbonate of iron which was retained in solution by excess of carbonic acid gas; that, as the excess escapes from the surface, the carbonate separates from the solution in the form of a fine cloud, and becomes ultimately precipitated in the form of an impalpable powder. So far as permanency is concerned, the preparation has stood the test of several months, and it now remains as good as the day when it was made.

Dose, Uses, Mode of Administration, etc.—The dose is a teaspoonful, more or less (about a drachm or a drachm and a half), twice or thrice a day, in half a tumbler or more of water, an hour after, between meals, or upon an empty stomach, as is found most suitable. Dilution, within reasonable bounds, increases the tolerance of the remedy and favours its therapeutic action. It may be drank during the action of effervescence, but it seems to me preferable immediately after it subsides. When a prolonged course of iron is required this preparation will never take the place of the protosulphate, the iodide, or the sesquichloride; but where a moderate course of a few days, or a week or two, is necessary, it will be well borne by the stomach. It is not only well borne, but it seems to produce a much more manifest chalybeate effect within a given time and in a smaller dose, than any other preparation of iron with which I have had experience.

In facial or other forms of neuralgia, arising from anæmia or other cause relievable by iron, and particularly if the bowels are at all torpid, a few doses often act like a specific. It ought, however, to be continued after the pain disappears, so as entirely to remove the condition upon which the neuralgia depends. I may remark that the quantity of iron, and the aperient effect might be doubled if required; the present proportions, however, have been found by experience to be the best for ordinary purposes.—*British Med. Jl.*, June 15, 1861.

15. *Sinapisms made with Glycerine.*—M. Grimault recommends the following formulæ: Pure glycerine 3½ drachms, starch 5 drachms, and volatile oil of mustard 20 drops; and M. Chevallier publishes the following formula for what he terms *Plastic Sinapisms:* Volatile oil of mustard 20 drops, white pitch 15 drachms. Having melted the pitch, remove it from the fire, stir in the volatile oil, and spread on leather. By the addition of 10 per cent. of resinous oil the mass can be spread on linen like ordinary adhesive plaster. For use a piece can be cut off according to the size of the part to which the sinapism is intended to be applied. The effect is very speedy, and the proportions of the active principle may be varied.—*Med. Times and Gaz.*, July 20, from *Journal de Chimie Méd.*, June.

MEDICAL PATHOLOGY AND THERAPEUTICS, AND PRACTICAL MEDICINE.

16. *Treatment of the Fever in the Zambesi.*—Dr. McWilliam read to the Epidemiological Society (June 3, 1861) a note from Dr. D. Livingstone, dated Tette, Nov. 28, 1860, on the treatment of this fever.

"In 1850 I adopted the plan of giving quinine, mixed with a purgative, as the first step of the treatment, and was successful in the cases of two of my own children, and an English party whom we found at Lake Ngami, and of whom one had died before our arrival. I have lost the notes of my reason for adopting the practice, but I have been successful in every case I have met with since. The prescription employed is resin of jalap, calomel, of each eight grains, quinine c. rhubarb, of each four grains, mix well together, and when required make into pills, with spirits of cardamom. Dose from ten to twenty grains. The violent headache, pains in the back, etc., all are relieved in from four to six hours, and with the operation of the medicine there is an enormous discharge of black bile; the patient frequently calls it blood. If the operation is delayed, a dessert-spoonful of salts promotes the action. Quinine is then given till the ears ring, etc. We have tried to substitute other purgatives instead of resin of jalap and calomel; but experiments have only produced the conviction that aught else is mere trifling. No strength is lost in our march up the river of 600 miles on foot. An European would be stricken down in one day, and the next after the operation of the remedy would resume his march on foot. In some very severe attacks it was necessary for the patient to travel on a donkey, but after two or three days he would prefer to tramp it. We tried Warburg's tincture, which has a great reputation in India, but it causes profuse sweating, and does not cure the disease: the strength is also impaired. We had a good supply, by the kindness of one of our nobility, but I am compelled to say that it did not answer our expectations. The daily use of quinine is no preventive. We have seen many cases occur when the person was on the verge of cinchonism. I employed the foregoing remedy with success on the west coast, but made no fuss about it more than to make a general statement in the *Missionary Travels*. I was not quite sure that our fever was identical with that Dr. McWilliam encountered in the Niger, but the melancholy fate of a party of six missionaries at Linyanti, where six out of nine Europeans and four native attendants perished in the short space of three months, makes me fear that it is the same complaint as that which destroyed the officers of Commodore Owen in the Zambesi, those of Captain Tuckey, in the Congo, and the crews of the great Niger Expedition in that river. My companions, Dr. Kirk and Mr. C. Livingstone, entertain the same idea of the value of our pills as I do. We wrote a paper for one of the medical journals, but the above sad case makes us anxious that the remedy should become more extensively known than it has been, and I do not know a better plan for effecting this than by communicating it to Dr. McWilliam. Those who may try the remedy will do well to remember that the above doses are for strong adults. I cured myself and native companions in this way during many long journeys between 1852 and 1856, and that the remedy has no bad effects on the system may be inferred from the fact that I have had no regular attack of fever since my return. I have had little illnesses, probably from exposure to malaria in its most intense forms, but nothing like what I formerly experienced; and I am of opinion that what we were all taught, not to give quinine till we had used the preliminary measures of relieving the bowels, was a mistake. [Query: Might the remedy not be applied to some of the fevers at home that arise in unhealthy localities?] Around every village in this country there is a large collection of human ordure during the dry season. This is swept into the rivers by the heavy rains, and you may guess the effect from hundreds of thousands of villages. The natives here do not drink water as the natives do on the banks of the Thames, but make holes in the sand to draw from. Possibly this has as much to do with the origin of fever as it has at home."

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17. *Process of Resuscitation after apparent Death.*—Dr. RICHARDSON, at the termination of his last Lettsomian Lecture, presented the following conclusions as the result of his investigations on the proper means of resuscitation:—

"In restoring animation, artificial respiration should always be first resorted to, in the hope that there may be still some remaining action of the heart. If artificial respiration fail, it need not be tried after fifteen minutes; it will merely cause emphysema. Whenever artificial respiration is used, it would be of great advantage to warm the air to a temperature of 130°. In recovery-houses for the recently dead, a heated room would be a most important addition. If electricity be tried, the positive pole should be passed through the jugular vein or one of the carotid arteries to the heart; while the negative pole, insulated to the tip, should be passed through the wall of the chest to the cardiac structure. The most probable means of resuscitation would be to inject fresh oxygenated blood by the arteries, towards the heart; but it remains still a desideratum to discover a fluid which, when warmed to 96°, will sufficiently represent blood."—*British Med. Journ.*, March 9, 1861.

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18. *Treatment of Delirium Tremens by large Doses of Tincture of Digitalis.*—Dr. T. B. PEACOCK, in an interesting paper (*Med. Times and Gaz.*, Aug. 3. 1861) on this subject, states that he has "gone over the records of St. Thomas's Hospital for the last two years, 1859 and 1860, and finds that 36 cases (32 males and 4 females) of delirium tremens were under treatment during that time. Of this number 9 (7 males and 2 females) proved fatal, giving the very high rate of mortality of 1 in 4, or 25 per cent. The treatment to which these cases were submitted varied considerably, but consisted generally (in 30 out of 35 cases) in the employment of opiates, solid opium, morphia, the tincture of opium, or the liquor opii sedativus, in combination with antimony, ipecacuanha, purgatives, ammonia, ether, and the stronger alcoholic stimulants, brandy and gin, etc. The opiates were, in some instances, several times repeated, but the doses were never very large. In some cases they were exhibited in the earlier, in others at the later periods of the disease, when other treatment of a more or less antiphlogistic character had been previously had recourse to.

"The opiate remedies I cannot but regard as often too indiscriminately employed in the treatment of the different cases which are ordinarily described as delirium tremens. If exhibited in small doses they are apt to give rise to excitement rather than to procure rest; and such is a frequent result in certain constitutions and particular states of system, even when the doses are large. When also we consider that in fatal cases of the disease, death is generally preceded by coma and convulsions, and, on post-mortem examination, the brain is usually found much congested, and there is not unfrequently serous effusion beneath the membranes or in the ventricles, indicating that more or less active inflammation or congestion had existed, the exhibition of large doses of opiate medicines cannot but be regarded as fraught with danger. I find that of the 30 cases in which opiates were given, the mortality was not less than 1 in 3⅓, or 30 per cent.

"The use of the stronger alcoholic stimulants in the earlier stages of the disease, also appears rather calculated to increase than to lessen the excitement of the patient. So far as my experience serves me, the symptoms most commonly supervene after a violent or very prolonged debauch, and only rarely from the sudden cessation of the accustomed stimulus. In the former class of cases, then, the exhibition of more stimulus when the blood and tissues are already saturated with alcohol, can only aggravate the evil.

"This objection does not, indeed, apply to the use of opiates in moderate doses, and of stimulants, especially the milder alcoholic beverages, when, towards the end of an attack, the patient, who had previously been treated by mild antiphlogistic measures, still continues restless and is becoming exhausted. Even, however, under these circumstances, there are objections to the use of the alcoholic beverages, which should cause them to be avoided, if that can with safety be done, or any substitute can be employed.

"It is evident also that the disapproval expressed of the use of opiates in cases of active cerebral excitement, does not apply to the treatment of cases in which the condition of the general system and of the brain is the very opposite to that referred to."

He further says that large doses (half ounce) of the tincture of digitalis have been administered in St. Thomas's Hospital in six cases, "five of these being cases of idiopathic delirium in which the affection was the direct result of excessive drinking, while in the sixth the disease was traumatic, or supervened in a man of dissipated habits, shortly after he had sustained a fracture of the thigh.

"In four of these cases only one dose of half an ounce was given; in a fifth, the same quantity was repeated after an interval of twenty-two hours; and in the sixth, the dose first given was only two drachms, and half an ounce was exhibited after an interval of about twenty-four hours. In two of five cases of which I possess notes, the stronger alcoholic stimulants were given in the earlier periods of the attacks, and in all but one or two, ammonia and bark were prescribed after the digitalis had produced its effects. The ages of the patients treated were 23, 30, 33, 44, and 45. The last patient only was a female, and all recovered.

"In no instance were any alarming symptoms of depression induced; but the pulse usually soon fell remarkably in frequency, and acquired greater power and steadiness. The sickness subsided; the tremor became less, and the patient was much quieted. It did not, however, appear that the digitalis directly induced sleep, but it calmed the patient and sleep seemed to ensue naturally, after a longer or shorter interval. The patient did not, however, sleep so soon, so soundly, or for so long a period, as, from Mr. Jones' report, had been anticipated; and in two cases morphia was given before rest was procured; while, in a third, small doses of compound ipecacuan powder were exhibited at short intervals during the attack. This difference may be due to the less liberal employment of the remedy at St. Thomas's. Mr. Jones states that he generally repeats the dose in four hours, and occasionally in a smaller quantity, for a second time; whereas at St. Thomas's two full doses were only prescribed in one case, and in that instance the second was given after an entire day had elapsed.

"The kidneys did not appear to have their action increased by the digitalis; on the contrary, so far as could be ascertained, the flow of urine continued, after the remedy was exhibited, to be only small in quantity.

"I would remark that it would be altogether premature to venture a decisive opinion upon the use of the large doses of digitalis in this disease; but the facts seem to warrant the conclusions—

"1st. That the drug, when exhibited in full doses, does not by any means produce the amount of depression which our previous experience of its action, in small and frequently repeated doses, would have led us to expect; and

"2d. That the remedy, in conjunction with other means, may probably be very usefully employed in the treatment of certain cases of the disease, and especially when it occurs in young and robust persons, whose strength has not been broken down by prolonged habits of intemperance; and particularly when it arises as the immediate result of excessive spirit drinking. Delirium tremens, like other acute diseases, occurs under varied and opposite conditions, and it would be alike opposed to sound theory and practice to extend the same treatment to all cases of the disease."

19. *Treatment of Acute Dysentery by Ipecacuanha.*—Dr. R. W. CUNNINGHAM, Assist.-Surgeon 4th Bengal Europeans, highly extols (*Edinburgh Med. Jl.*, July, 1861) the plan of treatment of acute dysentery advocated by Surgeon Docker, which he has lately employed in a number of cases. This treatment consists in the administration of ʒj—ʒjss of the ipecacuanha in one dose.

The plan of treatment is as follows:—

"On admission, a sinapism is applied to the epigastrium, and ♏xxx of tincture of opium are given, for the purpose of rendering the stomach more tolerant of the remedy. An hour afterwards, ʒj—ʒjss of ipecacuan is given in powder. Mr. Docker recommends it to be given half an hour after the tr. opii; but, by waiting for a whole hour, the medicine is retained longer, and produces a more powerful effect. As may be supposed, considerable nausea is the result; but vomiting does not generally come on until at least an hour afterwards, sometimes two hours. During this nausea, copious perspiration is produced over the whole body; the pulse becomes more full and soft, and less frequent; the countenance loses the expression indicative of suffering, so marked in acute dysentery; tenesmus and abdominal pains immediately cease, and the patient has no more stools for twelve, and sometimes for twenty-four hours. As soon as the nausea passes off, he expresses himself immeasurably relieved. The perspiration is kept up for a considerable time, and, of course, he feels languid and depressed for a little: but this has not, in any case that I have seen, proceeded so far as to call for any interference. When the patient next goes to stool, he does so without pain or tenesmus; the evacuations are fluid, and hold in suspension small masses of feces, but are entirely free from blood or mucus. Sometimes the first dose is not sufficient, the dysenteric stools returning after a short interval; in which case a repetition of the dose will be required. Chicken broth and arrowroot is the only diet allowed. In most of the cases that I have met with nothing further has been required, after the action of the ipecacuanha, than to keep the patient upon the above-mentioned diet for a few days, until the bowels recover their tone; or, if any tendency to debility manifested itself, a few doses of infusion of chiretta with nitro-muriatic acid have been sufficient to complete the cure."

Dr. C. says that none of the cases treated by him in this way suffered a relapse.

It should be remembered, that the cases treated by Dr. C. were in the first stage, and no destruction of tissue had yet taken place, nor had any complications occurred.

20. *Ipecacuanha in Diarrhœa and Dysentery.*—Dr. M'KIDD narrated to the Medico-Chirurgical Society of Edinburgh, June 5, a case of an individual who had suffered from diarrhœa for ten years. During this period all ordinary remedies had been employed, but without any good effect, and latterly the patient had ceased to take medicine, and had abandoned himself to despair. It then occurred to Dr. M'Kidd to make a trial of ipecacuanha. The medicine was administered in twenty-grain doses (reduced in a few days to ten grains), in the form of pill, every twelve hours, and the effect was most remarkable. By the end of the first week the diarrhœa was almost entirely checked, and the patient had a feeling of well-being such as he had not experienced for ten years. The cure had been permanent, upwards of three months having elapsed without any recurrence of the complaint.—*Edinburgh Med. Jl.*, July, 1861.

21. *Action of Phosphorus on Phthisis.* By R. P. COTTON, M. D.—The generally admitted tonic and stimulating action of phosphorus, as well as its existence in so many of the important structures of the body, made me anxious to

try its effects upon phthisis. I accordingly administered it to twenty-five unselected in-patients of the Consumption Hospital, those only being excluded in whom the disease was too far advanced to expect that any kind of treatment would avail much, or in whom there existed some gastric or other complication, which would seem to render the phosphorus inadmissible.

Of the twenty-five patients, ten were in the first, four in the second, and eleven in the third stage of consumption. Eleven were males, and fourteen females. Their ages varied from nineteen to fifty-five years. Perhaps I should here mention the mode in which the phosphorus was administered. Ten grains of phosphorus and an ounce of oil of sweet almonds, were put into a phial, and exposed to the heat of boiling water for half an hour; the solution, when cold, being carefully strained through blotting paper. By this process, which is that recommended in the Prussian Pharmacopœia, four grains of phosphorus remain in permanent solution. Of this, from five to eight or ten minims were given twice or three times a-day, suspended in a little mucilage, and disguised by cinnamon water. Five minims would contain one-twenty-fourth of a grain of phosphorus. The dose, according to its effects, was continued for a longer or shorter period, the longest being eight weeks, the shortest, one week.

Of the twenty-five patients, four improved *greatly;* five improved *slightly;* and sixteen either made no progress at all, or became worse. Nine gained in weight; twelve lost weight; and four remained unchanged in this respect. In one case the gain amounted to eight pounds in one month; in another to fourteen pounds in two months; but in each of the other cases where there was an increase, the gain was trifling, not exceeding one pound.

In eleven instances the appetite sensibly diminished, and in two or three of these cases the phosphorus evidently occasioned gastric disturbance, accompanied by diarrhœa; but in the other fourteen patients, the appetite remained good, and in some of them actually improved under the treatment.

Of the four *greatly* improved cases, one (in the first stage of the disease) quite regained his health; and the other three (two of whom were in the first, and one in the third stage) left the Hospital materially improved in every respect, their coughs having diminished, and their general health being greatly restored. Of the five *slightly* improved, some gained a little in weight, but three at least of them seemed to profit more when the phosphorus was exchanged for steel and quinine. Of the sixteen cases apparently uninfluenced by the phosphorus, several improved under the subsequent use of other tonics.

The observations of my late esteemed and lamented colleague, Dr. Theophilus Thompson, upon the use of phosphorus in phthisis[1] are far from encouraging. He believed that, in some instances, it might act favourably as a stimulant, but that its effects even in such cases were transient. I am not aware of any other published record of the influence of this substance in any of the varieties of tuberculosis.

All things being considered—the fact that improved diet, diminution of care, and quietude, are of themselves sufficient to effect a very great improvement among the patients at the Consumption Hospital, especially on their first arrival, I cannot help coming to the following conclusions, viz:—

1. Phosphorus exerts no *specific* action upon consumption.
2. In some cases it seems to act as a tonic and stimulant; but its influence, even in this respect, is inferior to many other remedies of a similar kind.
3. Although in many cases it seems to agree very well with those who take it, yet it sometimes occasions loss of appetite, nausea, and abdominal derangement.—*Med. Times and Gaz.*, July 6, 1861.

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22. *Opium in Large Doses, and Inhalation of Chloroform in Idiopathic Tetanus.*—According to the results of experience, opium is still the most efficacious remedy in the treatment of idiopathic tetanus, and its use may be continued with safety for a long period. Two cases which occurred in the practice of M. Grisolle appear to leave no doubt upon this point; and one of the cases presents this peculiarity, that it shows how much superior opium is to inhala-

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[1] Clinical Lectures on Consumption, p. 97.

tions of chloroform, to which latter great efficacy was at first attributed. The fact is, that although the inhalations of chloroform suspend for a short period the symptoms of tetanus, they do not remove them altogether, and with the elimination of the chloroform the disease resumes its primitive character and pursues its course. The two cases recorded were those of a man and a woman, both of whom, without any appreciable cause, were attacked with tetanus. In the first, which was that of the man, inhalations of chloroform were repeatedly employed, with temporary relief; but as soon as the effects of the anæsthetic passed away, the tetanic convulsions reappeared. At last, opium was given in the dose of five centigrammes every hour (a centigramme is .1543 of a grain); and after some days of this treatment, during which a large quantity of opium was taken by the patient, the tetanic symptoms disappeared, and the patient completely recovered. In the other case, that of the woman, the opiate treatment was pursued from the first, the bowels, however, being relieved by castor oil and purgative injections, and after persevering in this treatment for some days this patient was also cured.—*Brit. and For. Med.-Chir. Rev.*, July, 1861, from *Bull. Gén. de Thérap.*, Jan. 15, 1861.

23. *Perchloride of Iron in some Cutaneous Affections.*—M. DEVERGIE, of the Hôpital St.-Louis, has observed some very satisfactory results from the use of perchloride of iron in the treatment of certain cutaneous diseases, and other practitioners have confirmed the merits of this kind of treatment. The two following cases are recorded by M. BOURON des CLAYES, of Créteil. The first was that of a man, sixty-five years old, who was suffering from eczema, accompanied with insupportable itching, extending from the scrotum to the margin of the anus. Poultices of potato-starch, ointments made with tar, and oil of cade were employed without success, and at length M. Bouron des Clayes lightly touched all the affected surfaces with a camel's hair pencil dipped in liquid perchloride of iron, over which he laid a thick coating of collodion. On the next day, the skin was a little brown, and completely dry over the whole extent of the eczema, and a fresh application was made of the perchloride and of collodion. The day afterwards, nothing remained except the colour of the skin to indicate that the patient had been affected with any eruption. The second case was that of a strong man, forty-seven years old, who suffering from itch, but who had also had for a long time *lichen agrius* of the forearm. M. Bouron des Clayes applied an ointment composed of perchloride of iron, bicarbonate of soda, and hog's lard, and at the end of a few days the itch had completely disappeared, the lichen was altogether improved, and he was rapidly cured.—*Brit. and For. Med.-Chir. Rev.*, July, 1861, from *Gaz. des Hôpitaux*, January, 1861.

24. *Pathology of Cholera, with an Exposition of the Causes that necessarily render all Medicine inoperative in that Disease.*—In a paper read by Dr. TOULMIN, of Brighton, before the Harveian Society, the author commenced by remarking that in medicine as in other sciences, dogmas were sometimes received as truths without having been proved to be true, and that this sadly impeded the advancement of knowledge. That in his present inquiry into the phenomena of cholera, he found one of these time-honoured beliefs obstruct his progress, and which it became necessary to refute before he could expect his theory of the disease would be honoured with the approbation of the Society. The dogma he referred to was, that in all cases death must necessarily ensue on the cessation of respiration or the circulation of the blood. To this he objected to this extent, viz., that where black blood was not being carried to the lungs or brain, death did not necessarily ensue on the cessation of those functions, but that a passive state of existence might continue for many hours, or even days, after these functions had completely ceased. As a proof of this, he instanced the act of fainting (which sometimes was of long continuance), drowning, the hybernation of animals, and more particularly the state of trance, of which he read the curious and interesting case of the Hon. Colonel Townshend, as given by Dr. Cheyne. He admitted that life consisted in a never-ending series of phenomena, not one of which could be arrested singly without the consequent death of the individual; but he proposed a case where, in full health, all the functions should be simul-

taneously suspended, where, although respiration had ceased, no carbonized blood was suffused on the lungs or brain, because the veins had ceased to carry any—where, although the secretion of urine was stopped, still no uremic poisoning ensued, because there was no metamorphosis of tissue going on to produce it; and then asked, what was there in such a case to produce immediate death? Life might be suspended, but not lost; and he contended that in a similar state to this persons continued to exist for a certain time in the collapse of cholera, and were thus frequently buried alive.

He then desribed cholera as a certain poison, *sui generis*, which was received into the blood, and which attached itself particularly to the serous portion of that fluid; but observed, that however virulent the nature of the poison might be, still all the subsequent phenomena, terminating even with the death of the individual, arose from a series of consecutive causes of the most simple and natural kind, originating in nature's efforts to expel this poison from the system through the medium of the alimentary canal—the rice-water evacuations being, confessedly, nothing more than serum derived from the blood. From these facts he drew the following important deduction—viz., that any attempt to arrest the diarrhœa of cholera was not only futile, but mischievous.

He then observed, that all the subsequent symptoms of the disease might be traced to this one conservative act of nature: as, first, the rapid cooling of the body, which arose from the absolute cessation of all combustion of matter; that this, again, was caused by all metamorphosis of tissue being arrested, which in like manner depended on the sudden congelation of the blood, as the necessary consequence of the sudden and total loss of all its serum, the very celerity of which cut off all further supply. The absolute cessation of the circulation of the blood, he remarked, was due to this one cause, conjoined to another, either of which was equal to the occasion—viz., the shock given to the heart's action at the moment the poison was first received into the system.

The author then remarked, that in such a state as this the patient ceased to be governed by the laws of animal life, and that the attempt to keep him warm, after his own power of generating heat was lost, by wrapping him in blankets, was as unphilosophical as it would be with a marble statue.

As a demonstrative proof of the absolute stagnation of the blood, and that all change of matter depending thereon had ceased, he instanced the state of respiration, the air inspired returning unaltered; the rapid loss of heat, as well as the power of generating it; the arrest of the secretion of urine, as well as of bile, and, indeed, of all functional activity. As a proof of the latter, he noticed that mercury never produced ptyalism, nor opium sleep; that calomel, when given, was found adhering to the lining membrane of the stomach unabsorbed; and he believed that in the state of collapse any poison might be given (not acting mechanically) with impunity, until reaction was again established, when its specific effect would for the first time become apparent, to the serious detriment of the patient.

The extreme thirst always attending on cholera he explained as the inevitable consequence of the great loss of fluid in the system; and cramp, as urea deposited amongst the fibrillæ of the muscles before combustion had entirely ceased, remaining unabsorbed.

In considering the treatment of the disease, he divided the period of its existence into two stages: the first (and where medicinal treatment was all important) extending to the commencement of collapse; the second as being the state of collapse itself, to which alone all his observations had reference, and in which the exhibition of medicine was as useless as it would be in giving it to an automaton. The author then asked what, pathologically speaking, the system most loudly called for? the answer to which, not only from science, but also from the patient himself, was—*water*, to dilute the crassamentum, and thus re-establish the circulation of the blood, which when once effected, life was saved. But how, he inquired, was this to be effected when all power of absorption was lost? By the endosmose of tissue, and by this alone. By this function, he observed—which plays so important a part in the animal economy, and, as is well known, is equally active in dead as in living membrane—the fluid swallowed is, in the most direct and simple manner, at once imbibed in its course through the alimentary canal by all the arts requiring it—by the coats of the bloodvessels, the areolar tissue, the abdominal cavities, and the viscera in general; and thus the whole system is supplied with its due degree of moisture, and this without any assistant action on its part. The author pointed out four ways by which water might be imbibed: by the mouth, the skin, the rectum, and by its injection into the veins themselves; but only drew the attention of the Society to the first two, which in practice, he observed, he had found all-sufficient. By the mouth, the ardent thirst of the patient imperatively called for water icy cold, and in fact his whole time should be employed in sucking ice and drinking water; whilst by wrapping him in the hydropathic wet sheet the whole surface of the skin imbibed water in the most subtle and effective manner. By these means, he observed, he had never seen a case in which reaction had not been established. At the same time he commented on the potency of the remedy, and urged the importance of seizing the golden moment when reaction was established to remove the patient from the wet sheet, and to place him in a room hotter than his blood, or in a warm bed, and then supplying him with some mild stimulant, in the selection of which he would rather be guided by the wish of the patient than his own fancy.

Throughout the paper the object of the author appeared to be, to insist on the occurrence of an absolute cessation of all capillary action, and consequently of the larger circulation of the blood, which he said gave the key to all the subsequent symptoms, and at the same time removed cholera out of the category of disease in general, necessitating a mode of treatment in which vital action was not required.—*Lancet*, Aug. 7, 1861.

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25. *Period of Incubation in Smallpox.*—Professor Dr. VON BARENSPRUNG gives the abstract of several cases, showing that in smallpox the interval of time between the infection and the eruption is always the same even under the most varied circumstances. It is well known that in cases of *inoculation* the local affection began about the fifth day; from the eighth to the ninth the eruptive fever set in; and from the tenth to the eleventh the general eruption. But the action of "*contagion*" has been considered as less uniform, and the period of incubation has been variously estimated by writers. For example, Naumann states it to be three days; Wilson, at from four to twenty days; Canstatt, at from eight to fourteen; Heim, at nine days; Hufeland at fourteen days; whilst according to Huxham, the eruption may be delayed for a month after the infection. Moreover, whilst fourteen days is considered by most as the medium period of incubation, it is considered that the character of the epidemic, as also the greater or less susceptibility of the patient, may modify it. The cases adduced by the author are certainly remarkable, and have all the character and value of direct experiment; they are as follows: On the 20th of January, 1851, a female who had never been vaccinated fell ill of confluent smallpox eight days after coming to stay in Halle, in which place, at the time, no cases of this disease existed. She died on the sixth day. On the 27th the body was examined post-mortem by Dr. Meckel, in the presence of several students and medical men; and as a result of the examination, no less than seven persons became ill of the smallpox. Of these, four had been present at the inspection, and three others were persons in close intimacy with those who had been present. In every one of these cases the disease broke out at the same time—namely, between from twelve to thirteen days afterwards.

A brief and condensed summary of these cases will be read with interest.

CASE I. A student began to be affected on the evening of the 8th of February; on the day following the fever greatly increased; on the morning of the 11th a roseola on the hands and feet appeared; on the 12th numerous red knots were seen over the whole body, which soon became actual pustules. The patient was well at the end of the month.

CASE II. A student felt unwell on the 8th of February, and on the 9th was in a high state of fever. The eruption appeared on the 13th. Termination favourable.

CASE III. A student was taken ill on the 9th of the month. The eruptive fever was active, but the pocks only very scanty. Termination favourable.

Case IV. A physician was affected with fever during the night, between the 8th and 9th of the month. Eruption on the 13th. Termination favourable.

Case V. A student who lived with one of those who had been present at the post-mortem examination, but who was not there himself, being previously in sound health, became ill on the 8th, and on the tenth was in a state of high fever, with headache. Two days later the pocks broke out. Termination favourable. He had been vaccinated.

Case VI. A physician who was present at the inspection had carried home a piece of the skin affected with the disease for examination. He remained unaffected himself, but his wife, who was pregnant, and who had been vaccinated in her youth *and only a year previously, with good results*, began on the 8th of the month: day following high fever. On the 10th delirium; on the 11th a scarlatina-like rash on the skin, delirium at evening; and on the 12th she was prematurely confined. On the 13th, remission of fever and lessening of the skin affection. The child lived fourteen days, and was unaffected by the disease.

Case VII. Was the child of the attendant at the post-mortem examination, who had sewn up and washed the body. It had not been vaccinated, and although its father and mother remained unaffected, fell ill on the 8th of February; on the 11th the eruption began, and on the 12th the whole body was covered. It died on the 14th with pulmonary symptoms.

Such are the various cases related by the author, which are so uniform in their nature, and occurred under circumstances so favourable to precise and scientific observation as to afford material for most trustworthy and valuable deduction. As he remarks, it is not a little remarkable that seven people so differently circumstanced and predisposed, some being vaccinated, others not so; some being adults, others children; some male, and others female, should, in spite of these differences, be all affected at the same period after exposure to contagion (and this notwithstanding that the intensity of the contagious influence was very unequal), for in every case the outbreak was between the thirteenth and fourteenth day after. The development of the skin-inflammation in the numerous cases was less uniform.

The author closes by relating one or two other cases which completely support the above observations, and which occurred under his own immediate notice in 1858.—*Brit. and For. Med.-Chir. Rev.*, July, 1861, from *Annalen des Charités Krankenhauses*. Band xix.

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26. *Cases illustrating the Causes and Effects of Obstructions in the Arteries, both of the Brain and of other Organs.*—Mr. S. W. Sibley made a communication to the Royal Medical and Chirurgical Society (June 25, 1861), the object of which was to review a series of cases which had occurred in the Middlesex Hospital, with the view more especially of testing the theory which ascribes these obstructions to the washing away of vegetations, etc., from the valves of the heart. The cases were divided into four groups. In the first group (eleven cases) were placed those instances in which softening of the brain was found associated with a plug in one of the cerebral arteries. In the second group were placed three cases in which there was softening of the brain associated with vegetations on the valves of the heart; but in these instances the state of the cerebral arteries was not ascertained. The third group was formed by two instances of cicatrix of the brain, which the author believed to have been produced by the plugging of a cerebral vessel. In the fourth group were placed ten instances in which there were fibrinous deposits in the internal organs, but in which the brain was not affected with softening. The cases were then analyzed. It was found that in twelve out of the fourteen examples of softening of the brain there were fibrinous deposits in the internal organs; the remaining two cases were not complete. It also appeared that, in twelve out of the fourteen cases of softening of the brain there were warty growths on the valves of the heart. In one of the remaining cases there was extensive atheromatous and calcareous disease of the aorta; in the other the heart and vessels were healthy, but there was hepatization of the lung. Other points relating to the fibrinous deposits in the organs were also analyzed; and this was followed by a comparison of the symptoms in the cases of softening of the brain. The author pro-

ceeded to describe the phenomena which followed the sudden obstruction of an artery. The complete arrest of circulation, the attempt at its restoration, and the reason why in the cases of the brain, spleen, and kidney this attempt is not successful. The partially restored circulation is characterized by a zone of enlarged vessels around, and by a low form of inflammation in the part affected. In consequence of this the nutrition of the part is damaged, and fatty granules accumulate among the cell-structures, thus causing the bright yellow colour which is seen in the so-called fibrinous deposits. As the circulation becomes more complete, the more plastic products of inflammation are formed, the yellow colour fades, the bright zone of enlarged vessels slowly disappears, and at length a cicatrix is formed. The paper concluded with a review of the arguments for and against the theory which supposes these fibrinous obstructions to have been washed away from the cavities of the left side of the heart. The author believes that obstructions may be formed in the arteries, or that they may be washed away from the heart; and after describing the mode in which obstructions formed in these two modes are to be distinguished from each other, he proceeded to give the reasons for affirming that in all the cases mentioned in this paper the plugs had come from the heart, from the arteries, or from an inflamed lung. The chief arguments made use of for arriving at this conclusion were: the peculiar appearance and structure of the plugs; their analogous structure to warty growths on the valves of the heart; the situation at which plugs are usually met with; the condition of the artery at the obstructed part; the occurrence of several plugs in neighbouring or distant vessels; the very frequent, or indeed almost constant, association with fibrinous deposits in the spleen and kidney, and, lastly, the arguments which are derived from a consideration of the symptoms of this form of brain disease.—*Med. Times and Gaz.*, July 6, 1861.

27. *Case of Traumatic Emphysema of the Liver.*—A case, probably unique, was recently related to the Paris Society of Surgery by M. CHABERT. A drunken artilleryman threw himself from a window and died three days afterwards from the numerous injuries received, a marked jaundiced condition of the skin previously manifesting itself. At the autopsy a multitude of small, irregularly-shaped elevations of a brownish-yellow colour covered the external surface of the liver. When punctured a noise like that from the bursting of a small bladder filled with air was heard. There were three lacerations of the organ two or three millimetres only in depth. Incisions into various parts of the liver gave issue to no fluid, their surfaces being dry and of a brownish-yellow colour, and presenting numerous vacuoli like a sponge. On pressing portions of the organ between the fingers crepitation was distinctly heard. The diminution of specific gravity was remarkable, portions of any part of the liver floating in water, and when compressed under this yielding numerous bullæ, which burst on the surface, the liver then sinking to the bottom. The surface of the gall-bladder (distended with deep-coloured bile) was covered by a great number of vesicles resembling those of the surface of the liver. No cadaveric change accounted for these appearances, as the autopsy was performed soon after death. The diaphragm and the intestines being completely uninjured, it cannot be admitted that the air contained in the liver could have proceeded from either the lungs or the intestines. M. Cruveilhier's failure in his experiments to inject the biliary passages from the duodenum forbids the supposition that the air gained access to the hepatic parenchyma by a reflex passage through the choledochus. We are thus driven to the supposition that the gas must have been formed within the liver itself, probably within the cellular tissue connecting the Glisson's capsule with the glandular tissue. In the *Union Médicale*, September 8, 1855, cases are related in which emphysema of the liver was connected with internal disease; but there is no other example of its dependence upon a traumatic lesion.—*Med. Times and Gaz.*, August 17, 1861, from *Union Méd.*, No. 84.

28. *Ozæna.*—Dr. DEMME, of Berne, states that he has seen a number of cases of ozæna, successfully treated by touching the nasal mucous membrane with saponine (a preparation of tar), and by injecting this same article into the nose.

SURGICAL PATHOLOGY AND THERAPEUTICS, AND OPERATIVE SURGERY.

29. *Statistics of Amputation.*—Dr. T. P. Teale has published (*Med. Times and Gaz.*, July 6, 1861) the statistics of amputations at the Leeds General Infirmary during the eight years preceding 1861. The operations were all performed by Dr. T., Mr. S. Smith, and Mr. S. Hey. Amputations at the joints are not included.

All the Amputations performed at the Leeds General Infirmary from Jan. 1, 1853, *to Jan.* 1, 1861.

	PATHOLOGICAL.			EXPEDIENCY.			PRIMARY.			SECONDARY.			TOTAL.			
	Cured.	Died.	Per cent.	Cured.	Died.	Per cent.	Cured.	Died.	Per cent.	Cured.	Died.	Per cent.	Total.	Cured.	Died.	Per cent. and average.
Thigh . . .	27	6	18.18, or 1 in 5.5	2	1	33.3, or 1 in 3	2	5	71.4, or 1 in 1.4	..	6	..	49	31	18	36.7, or 1 in 2.7
Leg	50	7	12.2, or 1 in 8.1	1	1	50, or 1 in 2	10	3	23, or 1 in 4.3	..	2	..	74	61	13	17.5, or 1 in 5.7
Arm	4	2	33.3, or 1 in 3	..	..	..	17	9	34.6, or 1 in 2.8	1	1	50, or 1 in 2	34	22	12	35.3, or 1 in 2.8
Forearm . .	9	..	..	..	..	..	16	1	5.9, or 1 in 17	5	1	16.6, or 1 in 6	32	30	2	6 2, or 1 in 16
	90	15	14 3, or 1 in 7	3	2	40, or 1 in 2.5	45	18	28.5, or 1 in 3.5	6	10	62.5, or 1 in 1.6	189	144	45	23.8, or 1 in 4.2

The unusually large mortality of amputations of the arm, Mr. T. says, is explained by the fact that of 34 amputations of the arm, 28 were traumatic, having generally resulted from severe accidents by machinery, often attended with serious injuries of other parts of the body.

The *causes of death* in the 45 fatal cases were as follows: Pyæmia, 24; secondary hemorrhage, 4; exhaustion, 4; shock, 4; other causes, 5; causes of death not recorded, 4.

Comparison of Rectangular with other Amputations.—Mr. T. gives the following tables illustrative of this:—

Amputations by other Methods than the Rectangular.

	PATHOLOGICAL.			EXPEDIENCY.			PRIMARY.			SECONDARY.			TOTAL.			
	Cured.	Died.	Per cent.	Cured.	Died.	Per cent.	Cured.	Died.	Per cent.	Cured.	Died.	Per cent.	Total.	Cured.	Died	Per cent. and average.
Thigh . . .	6	1	14.28, or 1 in 7	..	..	..	1	5	83.3, or 1 in 8.2	..	1	..	14	7	7	50, or 1 in 2
Leg	20	3	13, or 1 in 7.6	..	1	..	1	3	27 2, or 1 in 3 6	..	2	..	37	28	9	24.3, or 1 in 4.1
Arm	1	1	50, or 1 in 2	..	..	..	11	7	38.8, or 1 in 2 6	..	..	..	20	12	8	40, or 1 in 2.5
Forearm . .	4	..	..	..	..	..	8	1	11, or 1 in 9	1	1	50, or 1 in 2	15	13	2	13.3, or 1 in 7.5
	31	5	13.9, or 1 in 7.21	..	1	..	28	16	36 3, or 1 in 2.7	1	4	80, or 1 in 1.25	86	60	26	30.2, or 1 in 3.3

In these 86 amputations by other methods than the rectangular there were 26 deaths, a mortality of 30.2 per cent. In 103 rectangular operations there were 19 deaths, a mortality of 18.4 per cent.

If we subdivide these two groups the following results are obtained:—

Of the 86 amputations by other methods than the rectangular, 37 were pathological with 6 deaths, a mortality of 16.2 per cent. Of 103 rectangular amputations 73 were pathological, of which 11 died, a mortality of 15 per cent.

Of the 86 amputations by other methods than the rectangular 49 were traumatic with 20 deaths, a mortality of 40.8 per cent. Of 30 rectangular traumatic amputations 8 died, or 26.6 per cent.

Remarks.—On reviewing the foregoing statements, additional confirmation is obtained of a fact already well established, that traumatic amputations are much more fatal than pathological; the rate of mortality at Leeds in the traumatic being 35.4 per cent., in the pathological 15.4 per cent.

Rectangular Amputations.

	PATHOLOGICAL.			EXPEDIENCY.			PRIMARY.			SECONDARY.			TOTAL.			
	Cured.	Died.	Per cent.	Cured.	Died.	Per cent.	Cured.	Died.	Per cent.	Cured.	Died.	Per cent.	Total.	Cured.	Died.	Per cent. and average.
THIGH . . .	21	5	19.2, or 1 in 5.2	2	1	33 3, or 1 in 3	1	..	..	..	5	..	35	24	11	31.4, or 1 in 3.18
LEG	30	4	11.7, or 1 in 8.5	1	..	..	2	..	..	..	..	..	37	33	4	10.8, or 1 in 9.2
ARM	3	1	25, or 1 in 4	..	..	..	6	2	25, or 1 in 4	1	1	50, or 1 in 2	14	10	4	28.5, or 1 in 3.5
FOREARM . .	5	..	..	..	..	..	8	..	..	4	..	..	17	17	..	..
	59	10	14.5, or 1 in 6 9	3	1	25, or 1 in 4	17	2	10.5, or 1 in 9.5	5	6	54.5, or 1 in 1.8	103	84	19	18.4, or 1 in 5.4

In the traumatic cases the secondary proved much more fatal than the primary; the rate of mortality of the secondary being 62.5 per cent., of the primary 28.5 per cent.

On comparing the mortality of rectangular with that of other amputations, the advantage is here shown to be obviously on the side of the rectangular, although the general results in this respect are scarcely equal to those obtained in the earlier of these operations.

The more favourable results which have hitherto attended the rectangular method, I am inclined to attribute chiefly to two causes; first, to the more complete covering of the end of the bone secured by this method; and secondly, to the avoidance of irritation and distress in the subsequent treatment; the repeated liftings of the stump, the strappings, and the circular bandagings, usually required in other amputations to prevent the retraction of the soft structures, being unnecessary in the rectangular.

In hospitals, when erysipelas and pyæmia are prevailing, stumps frequently "open out," suppurate, or become phagedenic. But when rectangular stumps are thus affected, and life is preserved, the resulting stump is, with very rare exceptions, a good one. In several cases, apparently most unpromising, although the stump has lain long without showing a disposition towards repair, yet when recovery was at length accomplished, there was a soft movable mass of tissues over the end of the bone, almost as satisfactory as in the cases which had done well from the beginning.

After ordinary amputations it is admitted by surgeons of great experience, that exfoliation and necrosis are *frequent*. After rectangular amputations they are *rare*. After 103 of these operations, in two cases only, and to a very small extent, have exfoliation or necrosis come under the knowledge of my colleagues or myself.

30. *Complete Cure of a Congenital Total Cleft of the Hard and Soft Palate by a New Operative Proceeding.*—Professor LANGENBECK exhibited at a recent meeting of the Medical Society of Berlin, a case of this. The patient. a boy aged 14, had been born with a cleft of the left lip and total cleft of the hard and soft palate together with the left alveolar process. The operation of hare-lip had been done soon after birth, but had failed; and a second operation made about a year afterwards, had been successful. On February 6 M. Langenbeck united first the cleft of the soft palate by means of a needle-instrument especially invented by him for this purpose. On May 11 he closed the hard palate in the following manner: Close to the edges of the cleft, the mucous membrane and the periosteum of the hard palate were cut through to the bone by means of a strong knife, and the edges of the cleft freshed up. By means of a raspatorium placed into these incisions, the mucous membrane and the periosteum were then drawn off and separated by blunt levers from the two halves of the hard palate. Thus two flaps were formed which were only connected anteriorly with the gums at the alveolar process, and proceeded backwards into the soft palate which had been separated from the posterior margin of the os palatinum. The edges of these flaps were then united by five silken sutures in the median line, and thus the whole cleft, up to the front teeth completely covered up. This separation of the mucous membrane of the palate and of the periosteum is troublesome, but can be done without in any way injuring other parts. The hemorrhage from the vessels of the periosteum necessitated repeated interruptions of the operation. which was, however, concluded in half an hour. After the sutures had been removed, which was done in the course of the second week, the cure by first intention was quite complete in the whole extent of the wound. The healed palate is only distinguished from a normal one by a fine cicatrix visible along its whole extent and a slight indentation at the top of the uvula. In another case of total cleft, in a woman aged 24, who came under M. Langenbeck's care a fortnight afterwards, he performed staphyloraphy and uranoplastics in the same sitting, and with the best result.—*Med. Times and Gaz.*, July 20, 1861.

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31. *Partial Amputation of the Foot.*—Professor LINHART, at a late meeting of the Physico-Medical Society of Würzburg, read a very interesting paper on the above subject. He introduced four male patients, on whom partial amputations of the foot had been performed, with the best success. The first case was one of tarso-metatarsal disarticulation according to Lisfranc; the second one of disarticulation in the tarsus according to Chopart; the two others, amputations with preservation of the posterior process of the calcaneus (or osteoplastic elongation of the leg according to Pirogoff). All these four patients walked firmly on the operated leg and without feeling the least pain. In the first there was scarcely any deviation from the normal gait to be seen; the third and fourth walked as patients do, if the tibio-tarsal joint is anchylosed; and in the second, on close observation, a sort of double tread was remarked, as he first treads on the tuber of the calcaneus, and then on the anterior part of the soles. This symptom was caused by the tuberositas of the calcaneus being lower down than the head of the astragalus and the anterior process of the calcaneus. Walking was, however, not in the least troublesome.

Professor Linhart said, that the foot, in standing, touches the ground with the tuberositas of the calcaneus and the capitula of the metatarsal bones only; the ligamentum calcaneo-cuboideum and calcaneo-naviculare plantare, which form the vault of the sole, bearing the weight of the body, like the springs do a carriage. The capitulum of the metatarsal bone of the great toe is the greatest and most important part of the anterior support of the foot. This explains why persons, in whom the metatarsal bone of the great toe has been removed, have a more uncertain tread than such in whom two or three other metatarsal bones have been taken away. The shape of the foot is similar to a spire, so that the back of it passes into the external, and the sole into the internal, surface of the heel. From these facts the professor established the rule that in disarticulations in the neighbourhood of the tarsus, the flaps ought to have an oblique direction, so that an external upper dorsal, and an internal lower plantar flap is to be formed, if we wish to avoid the inconvenience of drawing the soft parts of the sole into the flap of the back, and *vice versâ.*

The professor then spoke about the so-called longitudinal amputation. He showed, on a foot just taken from a dead body, how we may, from the interval between the third and fourth toe, divide the foot in two longitudinal halves, of which the external contains the metatarsal bones of the fourth and fifth toe, the os cuboideum and the calcaneus, while the internal half consists of the three inner metatarsal bones, the os naviculare and the astragalus. Such a total longitudinal amputation has never yet been performed on a patient; professor Linhart, however, considers it practicable and likely to answer very well; only there will be very few cases in which it could be indicated. The longitudinal amputations hitherto performed have been confined to the removal of some metatarsal bones with the os cuboideum and the sphenoid bones.

In transverse amputations, the chief rule is to preserve as much as possible of the limb, as experience shows that all transverse amputations yield favourable results. It is much to be regretted that Chopart's operation has been so seldom performed in recent times; there is no tangible reason for this to be found, but it seems to have gone out of fashion. The reasons adduced for neglecting it may be easily refuted; and if in former times frequent relapses of caries, impossibility of walking, and other unpleasant symptoms were observed, the cause was that the operation, after having come into fashion, was performed too frequently and without the right indications. The permanent drawing up of the heel, which has been often mentioned as a consequence of Chopart's operation, is certainly very rare. Professor Linhart has never seen it; in one case only he noticed a slight painful spasmodic drawing up of the heel by the tendon of Achilles.

With regard to the tibio-tarsal disarticulation, the professor said that the operation, according to Jaeger and Syme, with enucleation of the calcaneus, should only be performed if this bone were also diseased; in other cases Pirogoff's method should be preferred. The objections made to this latter operation are entirely unfounded, especially that the sawed surfaces did not unite. In a patient introduced by M. Linhart, suppuration had set in on these surfaces, and, nevertheless, osseous union took place in the end. The greater length of the limb, after Pirogoff's operation, is very important. The abscesses which may form are of no consequence if at once recognized and opened. The diagnosis of them is, however, not always easy, and frequent observations and examination of the leg and foot is required for it. This circumstance is the chief objection to be raised against the application of the gypsum-bandage in such cases; and it is better to place the diseased foot on a cushion which is hollowed like a groove.—*Med. Times and Gaz.*, July 20, 1861.

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32. *Statistics of Operations for the extraction of False Cartilages in or about the Knee-joint.* M. HIPPOLYTE LARREY has communicated the following interesting statistics on this subject, reaching from the days of Ambrose Paré to our own time.

Out of a total of 168 cases of extraction, 129 were by direct incision, and 38 by the indirect or subcutaneous method. The results stand thus:—

No. of Cases.	Cured.	Failures.	Deaths.
129	98	5	28
38	19	15	5

The extraction of false cartilages of the knee-joint is, according to M. Larrey, a grave operation when practised by direct incision, and difficult when by the subcutaneous method. The dangers resulting from the presence of the foreign body are much less to be dreaded than those to be apprehended from the operation; and though, no doubt, as seen by the above figures, a large proportion of cures has been registered, many failures have been passed over in silence, and not boasted of. The operation should never be performed unless the following conditions [illegible] realized:—

1. Complete mobility of the false cartilage.
2. Presence of [illegible], effusion into the joint, lameness, and other ill effects resulting from its presence in the articular cavity.

3. Failure of palliative measures.

4. Express desire of the patient to undergo an operation, after all its dangers and difficulties have been fully explained.—*Lancet*, June 15, 1861, p. 599.

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33. *Radical Cure of Inguinal Hernia.*—Holmes Coote, Esq., Ass. Surg. St. Bartholomew's, brings forward (*Lancet*, June 1, 1861) some striking facts, to show that Wützer's operation for inguinal hernia cannot be depended on for a permanent cure.

"Those," he remarks, "who are in the habit of frequenting the wards of St. Bartholomew's Hospital may remember my directing attention in the early part of this year to a case in which I was called upon to operate for the relief of strangulated inguinal hernia on a man on whom I had performed Wützer's operation for the radical cure of hernia three years previously, with apparent success. In this case, as in most others, the inverted plug of integument had come down, and a fibrous constriction of the peritoneal sac remained, which proved the seat of the stricture. I believe this fibrous constriction, in part at least, to have been due to the changes consequent upon the passage of the needle in Wützer's operation, and it had served to keep up the intestine very fairly for above two years and a half. It then yielded, and became the seat of stricture to a protrusion somewhat larger than had ever been before.

"I saw last year a boy on whom I had performed Wützer's operation six months previously. In his case, too, the intestine had come down again; the protrusion was of larger size, and the adaptation of a truss was difficult.

"Under these circumstances, I was induced to ask my friend, Mr. Kingdon, Surgeon to the City of London Truss Society, the results of his experience amongst those who apply to him for trusses, and he favoured me with the subjoined list of cases, which I inclose, with all the details, that any of the surgeons who operated may be able to verify or to contradict their accuracy.

"There can be only one opinion respecting operative surgery. Its only claim is based upon the permanent benefit which it can effect; and if experience proves that any one operation fails, even at a remote period, in its object, it is the duty of those acquainted with the failures to make the facts public, in order that a proper value may be attached to the proceeding.

"Case 1. Thomas B., aged thirty-five, of Welling, Kent. Ruptured for the first time at the age of thirty-two. Wützer's operation for the radical cure of hernia was performed in St. Bartholomew's Hospital, by Mr. Coote in 1858. Case reported as cured. In 1859 he applied for a truss, at the City of London Truss Society, with oblique hernia on both sides.

"Case 2. Nathaniel J., aged forty-five, of Phœnix Terrace, an engineer. Operated on in the same way as Case 1, by Mr. Coote, three years and a half ago. He continued well until a few months back. Has applied for a truss, having now hernia on both sides.

"Case 3. Thomas P., aged thirty, West India Road, Limehouse. He was first ruptured at the age of twenty-eight. The operation for the radical cure was performed by Mr. Corner, of the Poplar Hospital. He applied for a truss, having a scrotal hernia, in 1859.

"Case 4. John H., aged fifty-one, of Churchway, Somerstown. The operation for the radical cure was performed by Mr. Erichsen. He applied for a truss in 1859.

"Case 5. James A., aged fifteen, applied for a protecting truss, having just risen from bed after the performance of Wützer's operation. No immediate protrusion.

"Case 6. John T., aged forty-four, of Duke Street, Westminster Road, bedstead maker. Ruptured at the age of twenty-four. He came for a truss at the Society's house in 1860, being at that time forty-four years of age. He had undergone the operation for the removal of a diseased testis nine months before, by Mr. Coulson, at St. Mary's Hospital. Had hoped that the hernia was cured at the same time. He now (1860) suffers from a large scrotal hernia.

"Case 7. George C., aged forty-three, of the Broadway, Westminster, gasfitter's labourer. The operation for the radical cure was performed by Mr. Lee, of King's College. He applied for a truss on Oct. 5th, 1860.

"'I thought,' continues Mr. Kingdon (writing to me), 'and still believe, that I had more of your cases; but the foregoing are those which I can vouch for at present. Two, and I think a third, of Mr. Hutchinson's have come before me; one also of Mr. Wood's.'"

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34. *Venous Hemorrhage.*—This subject has been very fully discussed by LANGENBECK in the first part of the *Archiv für Klinische Chirurgie.* The causes of difficulty or impossibility of arresting venous hemorrhage are, adhesion of the vein to the neighboring parts; pressure of the column of blood; and regurgitation of the blood. The first mentioned cause of difficulty is especially observed in trephining and in operations for necrosis; and in operations involving the veins of the neck and upper part of the thorax, as the subclavian, external or internal jugular, and axillary. Death may follow wounds of the external jugular vein, even above the point at which it penetrates the cervical fascia. The division of the axillary vein gives rise to unimportant hemorrhage in comparison with the external jugular, because it is but loosely connected with the fascia, while the external jugular is stretched by the fibres of the platysma myoides. Hemorrhage in wounds of the large veins may take place from the peripheric as well as from the central end. From the former, the blood flows in a steady stream; from the latter, the bleeding occurs during expiration, or during crying or coughing. Gaping incised wounds of the common jugular vein are fatal, unless immediate surgical aid be at hand. In penetrating wounds of this vein, the blood poured into the sheath may act as a compressing agent and close the orifice; but, if the blood escape into the cellular tissue, a troublesome sanguineous tumour is the result. Suppuration, secondary hemorrhage, and pyæmia may also follow punctured wounds of the jugular. Gunshot wounds of the large internal veins, or of the internal jugular, may not give rise to serious bleeding at the time, but are liable to be followed by secondary hemorrhage and thrombus.

Ligature of the corresponding artery is a sure means of arresting hemorrhage from a large vein, as the internal or the external jugular, after compression has been tried and has failed. Hemorrhage from wounds of the external iliac and femoral veins is more troublesome than might be expected from their small size and their distance from the heart. In wounds of the internal jugular, the pressure of the column of blood may be diverted to the vein of the opposite side by compression, in consequence of the free communication through the cranial sinuses; while, in the veins of the lower limb, this cannot be done. The iliac and pleural veins bleed usually from the peripheric end; hence J. Roux has advised ligature of the femoral vein in disarticulation of the thigh. Langenbeck, however, has in six cases observed no hemorrhage from the femoral vein in this operation, although he did not tie the vessel—a proceeding which he considers dangerous.

Dangerous, and even unmanageable venous hemorrhage may be produced by compression of a venous trunk above a wound, by the pressure of a tumour, by obliteration of a vein, or by interference with the pulmonary circulation. In the leg, for instance, venous hemorrhage is not unfrequently produced by the bursting of varicose veins. Hemorrhage from wounded veins, the trunks of which are compressed by tumours, demand ligature of the corresponding artery. Very obstinate also are the capillary venous hemorrhages, dependent on rupture of the small vessels and compression of the venous trunks. Spontaneous hemorrhage from tumours is generally venous or capillary, when it arises from pressure of the veins returning the blood. It occurs most readily in very vascular growths, permeated by enlarged sinuous veins, or constricted at the base by the neighbouring parts. Hemorrhage may occur from internal piles, when they are extruded in defecation and compressed by the sphincter ani; or from polypi of the fauces or of the uterus, when the bloodvessels in them have a cavernous structure. Cirrhosis of the liver sometimes, but very rarely, produces vesical hæmaturia through obstruction of the inferior cava; generally, however, the gradual development of the cirrhosis allows the establishment of a compensatory circulation through the anastomosing veins.

The fact that the venous hemorrhage in great operations varies with the respiratory act, has led Langenbeck to desire the patient in such cases to breathe deeply; that is, of course, unless he be under the influence of an anæsthetic. But in wounds of the large veins of the neck, deep inspiration must be avoided, on account of the danger of the entrance of air into the veins. In tracheotomy, the hemorrhage from the thyroid veins is arrested by the inspiration, which takes place as soon as the air-passages are opened. Styptics are regarded by Langenbeck as of very little use in obstinate venous hemorrhage; while, in ordinary cases, the bleeding ceases spontaneously. Obstinate bleeding from the smaller veins is best arrested by the actual cautery. In hemorrhage from the larger veins, compression with the finger must be first tried; a slight amount of pressure may be sufficient. When a vein of one of the limbs is cut across, compression of the distal end is generally sufficient; but, if this fail, the proximal end must also be compressed. In wounds of the external or of the common jugular, the compression must be first applied to the central or proximal end, on account of the danger of entrance of air. In hemorrhage from the larger veins, digital compression is only a temporary means, and must be replaced by a bandage. The object of the bandage is to close the wound without impeding the circulation; and for this purpose Langenbeck prefers strips of sticking plaster, where the edges of the wound can be brought together. When the vein lies deep, and the edges of the integument will not come together, he advises that a piece of lint smeared with cerate be laid on the vessel, and that compression be made by filling the wound with charpie. If a ligature must be applied, it is generally sufficient to tie the distal end; but the proximal end must also be tied, if large branches open into it. In the removal of tumours, when it is an object to avoid loss of blood, the vein may be ligatured in two places previous to the operation, and cut through; the ligatures are removed after the operation. Ligature of veins is, however, to be avoided as much as possible, especially in large hospitals, on account of its liability to be followed by thrombus and pyæmia. The vein may again become pervious, by the removal of the thrombus formed in it when ligatured.

On ligature of the arteries in venous hemorrhage, Langenbeck remarks that the dread of inducing gangrene has probably restrained surgeons from having recourse to this proceeding. But, while ligature of a large artery may be followed by capillary anæmia and functional disturbance of the part supplied, which may be gradually removed as the circulation becomes re-established; ligature of a vein is likely to produce venous capillary hyperæmia and serous exudation, and even inflammation of the vessel. Ligature of both the artery and the vein, however, appears less likely to produce mischief than when only one vessel is tied; at least, Langenbeck has in two cases tied both the carotid artery and the common jugular vein, and in neither were there any symptoms of importance referable to disturbance of the cerebral circulation. He refers also to a case in which hemorrhage of the femoral vein was arrested by ligature of the corresponding artery; and to an instance of popliteal aneurism mentioned by Crisp, in which hemorrhage from the wounded popliteal vein ceased when the artery was tied. He is evidently reluctant to tie a vein when such a proceeding can possibly be avoided.—*British Medical Journal*, June 15th, from *Schmidt's Jahrbücher*, Bd. 109.

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35. *Treatment of Bubo by Injection.*—Dr. Pizzorno strongly recommends the following mode of treating bubo, which he has pursued in more than 500 cases with great advantage and no ill effects: When suppuration cannot be prevented, the bubo should be opened sufficiently only to discharge the pus and to admit the point of a small glass syringe. A solution of corrosive sublimate (two grains to three ounces) is then to be thrown in with force two or three times in succession, and after the sac of the abscess is thus well washed out, a little of the solution is still to be left within it, the aperture being then covered with some shreds of lint and compresses moistened in the solution. Pressure is also to be made with a long and broad bandage. Sometimes at the end of the first twenty-four hours suppuration has ceased, and the external application alone has to be continued. When this is not the case the injection has to be repeated every twenty-four hours until the suppuration ceases. Upon an average about seven-

teen days are required to obtain a complete cure of the bubo. In indolent bubo, when frictions with extract of cicuta and blue ointment, a few doses of calomel, and compression by bandages do not succeed, the author applies a blister and dresses it with a weak solution of corrosive sublimate.—*Med. Times and Gaz.*, August 17, 1861, from *Omodei's Annali*, Feb.

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36. *Gunshot Wound of the Heart.*—Dr. R. ADAMS read before the Surgical Society of Ireland an interesting case in which the left ventricle of the heart was perforated through and through, by a gunshot wound made by a leaden slug the size of a small swanshot. The subject of it was a man æt. 43, who, whilst passing along the street, accidentally received the contents of a gun. The man, when shot, staggered back, but soon recovered himself, and ran unassisted into a neighbouring surgeon's shop, complaining of weakness, and having the aspect of extreme exhaustion. He was speedily taken to the Richmond Hospital, Dublin. When he arrived there, he was pale, pulseless, and gasping. He was offered a wineglassful of brandy, which he drank well, then expressed a wish to be raised from the horizontal posture and be placed sitting, which was done accordingly, but in five minutes he expired, having lived about one-half hour after he had been wounded.

On post-mortem examination the next day, it was found that the slug had entered the skin behind and below the level of the nipple of the left breast, struck the fifth rib, and then passed through the intercostal space between the fifth and sixth rib, traversed the pericardium and left ventricle of the heart. Two ecchymosed spots on the outside of the pericardium showed the places of entrance and exit of the shots. The pericardium was distended with coagulated blood, which was seen to ooze out through the small apertures made by the fatal shot. The bag of the pericardium was then slit up, the mass of black coagulated blood sponged out, and two round holes, capable of permitting a goose-quill to pass through, was noticed to perforate the left ventricle. The anterior opening, or that of exit, made by the slug in the left ventricle, was about the size of a split pea, rounded in form, but presented somewhat of a lacerated margin, and with an ecchymosed areola round it. The posterior opening, or that of entrance, was smaller, more regular in form, and scarcely any ecchymosis around its margin. When the relative position of the six perforations, which the fatal shot had made, was contemplated, and a probe passed from the external wound, it was plainly to be inferred that the most posterior wound in the skin behind the nipple of the left breast was the spot where the shot first entered, that the fifth rib was struck, and caused this shot to turn a little downwards, and that it thence passed from behind forwards, having entered the left ventricle of the heart posteriorly behind its left margin, about an inch and a half from its apex, and passed out in front close to the anterior edge of the septum ventriculorum. Looking at the relative position of these openings, it is difficult at first to conceive how a part of the left ventricle, so deeply situated in the thorax as the opening of entrance was, could have been thus wounded; we must under the circumstances only conclude, that at the critical moment the heart was stricken the whole organ must have been strongly rotated on its long axis from left to right, and the left margin of the heart thus become elevated. Search was made for the slug near to the junction of the diaphragm, with the base of the thorax anteriorly, but it could not be found. It is easy to imagine how the left lung could have escaped when the slug made its exit anteriorly, as this is the part of the heart uncovered by the lung, but difficult to conceive how so retired a portion of the left ventricle could have been thus penetrated and the left lung escaped, which appeared to have been the case, as no ecchymosed spot appeared on this organ, nor had any air escaped, as the lung at the part under examination was full and distended, concealing the pericardium.

It would appear that the slug in its course passed rather obliquely through the wall of the ventricle, and that the little canal which formed its trajet only communicated in about the middle of its course by a small lateral opening with the cavity of the left ventricle. The ultimate result was, however, the same as if the cavity of the left ventricle had been more directly traversed through and through at once. These two small perforations in the left ventricle of the heart permitted the blood to ooze out gradually, and in the course of half an hour (the time the man lived after the injury) so much blood had exuded from the interior of the heart as was sufficient to exert such a pressure from without on the ventricles and auricles, so as to annihilate the heart's action, prevent its diastole, and cause death. In short, the external pressure of the effused blood had completely compressed the heart just in a similar manner as we occasionally see the lung compressed and its function annihilated by pus in empyema, by water in hydrothorax, or air in some forms of traumatic emphysema.—*Dublin Medical Press*, April 3, 1861.

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37. *Congenital Phymosis considered as a frequent Cause of Irritation of the Urinary Organs of Young Children, and the Importance of its early Recognition and Removal.*—Mr. Price, in a paper read before the Medical Society of London, stated that one of the most common deviations from the normal construction of the preputial and glandular portions of the penis, consisted in an undue prolongation of the prepuce, adhesion of the mucous membrane of this structure to the glans, and the retention of a quantity of secretion from the odoriferous glands around the corona glandis. Such a condition is termed phymosis and might be either congenital or induced. He intended, however, strictly to confine his remarks to the congenital form, and to show that such a malformation proves a very frequent cause of genito-urinary disturbance in male infants and boys. Congenital phymosis, although a very common condition, is one which does not always attract the notice of the surgeon, and lead him to the correct appreciation of the true cause of various urinary complaints in infant life. Sir Charles Bell, Mr. Guthrie, and other well known writers on Diseases of the Urinary Organs, had failed to allude to congenital phymosis as the cause of certain urethral and bladder affections in the young.

Latterly, however, greater consideration had been paid to the subject; but still it was one which had not attracted the attention it deserved.

The author then proceeded to detail the most common results which follow in infants and boys from congenital phymosis, and stated that they might be enumerated under five distinct heads:—

1st. A preputial obstruction to the flow of urine, and its more or less permanent retention.

2d. Constant irritation of the glans penis and urethra.

3d. Vesical irritation, accompanied by incontinence or retention of urine.

4th. Hypertrophy of the muscular coat of the bladder, associated with symptoms bearing a close analogy to those of catarrh and calculus vesicæ.

5th. Pain and swelling of the testicle.

Each one of these conditions was illustrated by a series of cases, which tended to prove that the abnormal conformation of the prepuce is a much more common cause of urinary and genital affections than is generally believed.

The author dwelt at some length on the great similitude between the symptoms caused by a tight congenital phymosis and those induced by the presence of a stone in the bladder, and quoted two instances to illustrate the serious mistake into which the surgeon might fall, by not obtaining a clear indication of the existence of a calculus prior to submitting a young patient, suffering from all the symptoms attending the presence of a stone, to the operation of lithotomy. With the usual description of congenital phymosis the author was disposed to find fault. It was generally stated, that "the unnatural narrowing of the prepuce, so that it cannot be readily retracted over the glans penis," constitutes the condition termed phymosis. True phymosis, however, consisted of something more than this; for besides the mere elongation of the foreskin, and its unnatural narrowing, there usually existed firm mechanical adhesion between the preputial mucous membrane and the glans penis, whereby the foreskin could not be retracted, and a quantity of the secretion of Tyson's glands became pent up without the least chance of escape. In fact, the author believed that it was this latter condition of parts which formed the chief or sole cause of genito-urinary disturbance. Such being the usual condition constituting congenital phymosis, it was evident that some of the operative measures generally advocated for the removal of the malformation are, to say the least, inefficient. It had been suggested by more than one surgeon, that a mere division of the mucous membrane of the prepuce was sufficient, and to effect this, it was proposed to divide the structure subcutaneously, by passing a thin bladder-knife through the preputial orifice. Such a plan might suffice if the mucous membrane remained non-adherent to the glans; but in congenital phymosis of young children, the author believed that in the majority of instances such was not the case. Many cases were quoted, showing that an inefficient operation was only fraught with temporary relief, and that after the lapse of even a short period, the unnatural state of parts returned. The author stated, that as he was in the habit of performing the operation for phymosis somewhat differently to most surgeons he would briefly detail the method he employed. In young children he usually advised the exhibition of chloroform, as much pain was not only thereby avoided, but it was exceedingly difficult, otherwise, neatly to finish the operation, owing to the contortions into which the little patient generally twisted his body. The prepuce being put on the stretch, so as to remove the orifice as far from the glans penis as possible, the blunt-pointed blade of a pair of scissors is passed through the preputial orifice to the distance of about a quarter or half an inch towards the corona glandis, and the prepuce divided through its upper surface. This will allow the glans to be seen, covered, in all probability, especially if the phymosis be congenital, by the mucous membrane of the foreskin, which will be found more or less tightly adherent to the glans. Laying aside the scissors, this adhesion is to be separated by somewhat forcibly retracting the back portion of the prepuce, and by means of the thumb-nail breaking through such points of union as may be more than usually firm. Around the fossa in front of the corona glandis will generally be found small patches, or masses, of hardened and otherwise altered secretion of the odoriferous glands, These being removed, the scissors must be again employed, and such portions of the redundant skin and mucous membrane cut away as will allow of the glans penis, after the edges of the wound are united, remaining uncovered. In removing the necessary portions of integument, the author generally contrives, by shaping the incision somewhat obliquely from above downwards, to avoid wounding the artery of the frænum, whereby there is little risk of secondary hemorrhage and infiltration of the loose tissue with blood—a result which he has frequently known prove troublesome, and for a considerable time retard the healing process. If, however, it be desirable to loosen the connection of the mucous membrane with the glans at that part which is called the frænum, instead of dividing the little artery which runs in this direction, it is better to separate, with the scissors the union of the frænum with the glans immediately in the line of junction, by which means the course of the vessel will be avoided. Mr. Price, although some surgeons do not follow the practice, is in the habit of keeping the mucous and cutaneous surfaces in contact by sutures, unless the patient on whom the operation is performed be very young. Sutures of the very finest silk are to be preferred to those in ordinary use, and made either of the same material or of metal, as they cause less irritation, and do not need removal before their destruction has been effected, in the course of a few days, by reason of the contact of the healing or other discharge. To prevent the urine, for the first few hours after the operation, from excoriating the edges of the wound, it is advisable to smear them with oil or cerate. In performing such an operation less danger will be run of wounding the glans penis—a result which the author has known to occur when the bistoury has been used. It must be recollected, that to obtain complete relief from a congenital phymosis, a mere slitting up of the elongated prepuce will not generally suffice; but a certain portion of the mucous membrane and cutaneous tissues must be removed.—*Lancet*, May 4th, 1861.

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38. *Coccygectomy.*—Prof. SIMPSON brought under notice of the Edinburgh Obstetrical Society (March 28, 1861), a patient in whom he had cut out a portion of the coccyx, and had thus cured her of a severe degree of coccyodynia. The case, which Dr. Simpson related at full length, had already been published in the *Medical Times and Gazette;* but he had asked the patient to show herself at the Society, in order that the members might satisfy themselves as to the

degree of relief that had been obtained.—The patient, on being interrogated by the Chairman, stated that she had suffered for many months from excruciating pains in the region of the coccyx, which never entirely left her, but were least distressing when she was standing or walking, whilst in other positions it was very intense. She could not sit on a chair with any degree of comfort, and only by resting on one hip at time. To lie on her back in bed was utterly impossible. She attributed the occurrence of the disease to exposure to cold whilst sitting on damp grass, watching clothes drying. She had got various remedies with a view to her relief; but the only lasting relief she had ever obtained was by means of an operation performed by Dr. Alexander Simpson (isolation of the coccyx, as that gentleman explained), which had left her free from pain for about a fortnight. The pain having returned, however, and become of a stounding character, she was sent into the hospital to have a piece of the bone removed; and, since the operation had been performed, she had found herself perfectly well, and was now able to do all her ordinary work as a laundress, for which she had been utterly incapacitated. So far as the coccyx was concerned, she felt no difference between its present condition and that in which it had been in her earlier years.

The Chairman thought the woman's statements very satisfactory.

Dr. Simpson begged to add, in reference to the disease, that he thought different sets of muscles were involved in different cases; and, to produce a cure, it was in most cases necessary only to divide the muscles affected, or their tendons. He had seen only this and one other case where isolation of the coccyx from the muscular and tendinous attachments had failed in effecting a cure. In some cases the operation required to be repeated, in consequence, probably, of some of the fibres of the implicated muscles not having been cut through. He had lately had under his care a lady from America, in whom a first operation afforded partial, and a second complete relief.—*Edinburgh Med. Jl.*, July, 1861.

OPHTHALMOLOGY.

39. *Treatment of Acute Glaucoma by Iridectomy.*—The following case occurred at the Moorfield's Ophthalmic Hospital, under the care of Mr. Dixon.

"Mrs. P., aged 46, was admitted December 27th. She was a thin, moderately florid woman, not subject to gout or rheumatism. Twelve days before admission, she had severe pain in the right eye, which came on suddenly at night. Next morning, she found that she could scarcely see with it; and the pain, still severe, had continued up to the time when Mr. Dixon saw her. Blisters and various applications had been used, but without any benefit. When admitted, she could with the affected eye only just distinguish light from darkness, and could not count fingers held up between the eye and the light. The sclerotic was dusky, leaden-coloured, and crossed by enlarged veins. The pupil was dilated moderately, and fixed. The fundus, as seen through the pupil, looked dull and yellow. The cornea had lost its brilliancy. Atropine did not produce any effect on the size of the pupil; whilst in the other eye the pupil readily dilated under its use. The ophthalmoscope was used; but a mere red reflex from the fundus was seen. The woman would not submit to the operation of iridectomy, which was at once proposed, until the 31st, the fourteenth day from the attack, when iridectomy was performed. The piece of iris removed was from the upper part. No chloroform was given. The pain was at once relieved.

"Four days after the operation, she had had no return of pain, and could read No. 10 of Jäger's test-types. There was a minute fistula in the cornea, to which Mr. Dixon applied nitrate of silver. She gradually improved, and was soon able to read small type.

"On January 25th, the left eye became suddenly very painful. The pain was in the globe; it was very intense, and was accompanied by vomiting. She was not seen by Mr. Dixon until the 28th. He then found that the eye was in exactly the same state as the right had been. She could only just count fingers. The pupil was dilated and fixed; and the fundus could not be illuminated by the ophthalmoscope. Iridectomy was at once performed, and with the same amount of success as attended the operation on the other eye. She can now see well with both eyes, and can read pearl type without the aid of glasses.

"Mr. Dixon remarked that, in this case, the disease had been of the exact form to the relief of which iridectomy is best suited; viz. *acute* glaucoma. In the chronic cases, as far as he had seen, little or no benefit followed the operation, but rather an increase of the irritation. It is interesting to note that the attack in the left eye occurred whilst the right was going on satisfactorily. The ophthalmoscope had not been used to examine the sound eye, and therefore no blame was traceable to it, as having re-excited the disease in it. The occurrence of glaucoma in the second eye a few weeks after it has attacked the first is quite in accordance with what is frequently observed; and hence, as both eyes generally suffer, the value of iridectomy is much increased."—*British Med. Journ.*, March 16, 1861.

40. *Encysted Abscess in the Vitreous Humour.*—Mr. J. G. HILDIGE records (*Med. Times and Gaz.*) a case of this rare affection. The subject of it was, a man 58 years of age, sallow, unhealthy looking, but who says he has always enjoyed good health, who had been suffering from inflammation of the eyeball for several weeks. The eyelids of the affected eye were very much inflamed and swollen, the folds of the integument being completely obliterated, the eye itself was intensely chemosed and projecting from the orbit, the cornea was opaque in its whole extent, and the severe lancinating pains in orbit and temple had almost wholly banished sleep for nearly a fortnight. The right eye was sympathetically affected, and he was unable to open it, on account of the very great sensibility to light. He stated that about five weeks previously he had caught cold in his eye while out walking, for which he had been treated at the dispensary in the neighbourhood. On his way to the dispensary one very cold morning, his symptoms became much aggravated, and on the following day intense pain in the eyeball set in, which was speedily followed by a total loss of vision. The pain was continuous, but was subject to exacerbations, which became intense at night, lasting until four or five o'clock in the morning, when it slightly abated. As the patient had been salivated, leeched, blistered, etc., without effect, and as he was wasted to the last degree, further medical treatment was out of the question; Mr. H. therefore, enucleated the eyeball and the following was the result of the examination of the eye made by Drs. Cruise and Curran:—

"The form of the globe was considerably changed, its antero-posterior measurement being much greater than in the normal condition; its transverse diameter was also slightly increased. The cornea was perfectly opaque, and its curve much greater than natural. On making a transverse section of the eyeball, a perfectly circumscribed abscess, about the size of a small pistol-bullet, inclosed in a membranous sac, and containing laudable pus, was observed in the centre of the vitreous humour. It was perfectly free, posteriorly and laterally, but anteriorly it was connected by fibrous bands to the ciliary body. The portion of the vitreous humour immediately surrounding the abscess was opaque, but no pus-globules were detected in it. The iris was attached to the cornea in its whole extent, the pupil was filled up with lymph, and the lens and its capsule were perfectly opaque. From the very great congestion of the choroid, I fully expected there would have been exudation found between it and the retina, and partial detachment, at all events of the latter, from the choroid, but neither one nor the other of these results was present. The increased sensibility and irritation of the right eye rapidly diminished after the operation, and the patient can now distinguish the surrounding objects with it.

"On referring to Professor Arlt's work on 'Diseases of the Eye,' I find the following remarks in the chapter on Exudations into the Vitreous Humour:—'Post-mortem examinations have proved beyond doubt that results occur in the vitreous humour, which can only be considered as the products of inflammation. It is, however, very probable that these products are not generated in the vitreous humour itself by inflammation of its substance, or of its enveloping membrane, but are carried into it from the surrounding tissues. For, neither the vitreous body, nor the hyaloid membrane, is furnished with vessels or nerves, without which inflammation cannot take place, and such products are never met with in the vitreous body, without inflammation of the choroid being present. The term 'Hyalitis' owes its existence, not to the observation of symptoms, which can only be referred to inflammation of the vitreous body, but to the attempt to create a train of phenomena for each tissue of the eye, which will convey the idea of inflammation of it, in order that no gap may be left in the systematic representation of the diseases of the eye. The only real foundation for the disease termed Hyalitis, is to be found in the occurrence of inflammatory products in the vitreous humour, which, however, can and must be explained in a very different manner. These products are the result of inflammation of the ciliary body or choroid, and are carried into the interior of the vitreous humour, in the same manner as the nutritious plasma in the normal condition.'"

MIDWIFERY.

41. *On Superfecundation and Superfœtation.*—Dr. Kussmaul distinguishes superfecundation from superfœtation, and he proposes the word "superimpregnation," in order to express a new conception, which has happened during the course of pregnancy. The author discusses the following four questions:—

Is it possible that during pregnancy new ovules can become mature and detach themselves from the ovary?

Is the state of pregnancy of a matrix simple, or of one of the halves of a double one, an absolute obstacle to a second fecundation?

What is the value of the facts recognized up to the present time relating to the result of superfœtation in a simple or double matrix?

The following are the results of researches to which Dr. Kussmaul devoted himself regarding this argument:—

1. We must distinguish superfecundation from superfœtation, and unite both these phenomena under the name of superimpregnation.

2. There is superfecundation, if, in consequence of several intercourses of the sexes, there is fertilization of several ovules which have been matured during the same period of ovulation. This phenomenon is proved in the horse, and exists in all probability also in man.

3. Superfœtation would take place if an ovule of the second or any other period during pregnancy could be fertilized, but until now the possibility of this fertilization has not been established with certainty in woman, because it is proved that ovulation exists in women generally during pregnancy, and that all cases considered until now as superfœtations are open to other interpretation.

4. We possess up to the present time no authenticated case of any individual superfœtation in extra-uterine pregnancy. Supposed cases of the sexes are explained by the fecundation of two ovules from the same period of ovulation, which are developed on different points in consequence of a new fecundation after the death of the embryo which was developed outside of the uterine cavity.

5. We possess no positive evidence that a woman whose matrix did contain a dead fœtus was able to conceive.

6. Neither the membrane nor the mucus which obstruct the cavity of the neck of the uterus, could be considered as an absolute obstacle to superfœtation in a single or double matrix.

7. The only obstacle which opposes the passage of the seminal liquor in a simple matrix in a state of gestation is the embryo itself, when it fills up the uterine cavity and closes the openings of the oviduct. In a double matrix nothing can hinder the passage of the seminal liquor in that part which has not been impregnated during the time of pregnancy.

8. The most probable facts with regard to superfœtation are those relating to the birth of twins at long intervals; but these facts can be explained as the

birth of twins, one of which was too forward, the other late; that is to say, the one took more time than the other for complete development.—*Dublin Med. Press*, Aug. 25, 1861, from *Presse Méd. Belge.*

42. *Modes of Termination of Extra-Uterine Pregnancy.*—Dr. Mattei relates the details of a case of extra-uterine gestation which occurred in his practice, and states the following results of his examination of the details of 100 recorded cases, references to most of which he furnishes. Of the 100 women, 12 died accidentally, after having retained the result of pregnancy during several years; 5 died in consequence of the accidents of pregnancy without the cyst having opened externally. In 37 instances an opening was made into the cyst through the abdominal walls—viz., spontaneously in 21 (20 of these women recovering), in 7 with the concurrence of art all recovering, and in 9 by gastrotomy, all recovering. In 8 cases the opening took place into the bladder, 2 of the women dying. In 7, into the vagina, the opening being spontaneous and fatal in 2, and artificial, with 4 recoveries, in 5. In 31 cases the opening took place into the intestinal canal, either with the intervention of art or not, and of these 12 recovered and 19 died. The author's conclusions are: 1. Old extra-uterine pregnancies allow of life being prolonged for many years, but such cases are rare (12 per cent.), and are especially met with when the fœtus dies at an early period, and when the cyst has remained of small size. 2. Extra-uterine pregnancy may (5 per cent.) become the cause of death without the cyst opening externally or into a mucous membrane. 3. Whether the cyst gives rise to accidents prior to or subsequent to its being opened, it is not easily tolerated by the economy, and is expelled in more than a third of the cases in from one to two years, in a sixth between two and five years, and so on in decreasing progression. 4. Of all the modes of termination that by an opening through the abdominal walls, whether spontaneous or artificial, has been the most frequent (38 per cent.) and the most favourable, serious inflammatory accidents and resorptions scarcely ever occurring. 5. Opening into the bladder is rare (8 per cent.) and less often followed by recovery. 6. That into the vagina is somewhat rarer still (7 per cent.), and what is surprising is that it is much oftener fatal, especially when art does not intervene. 7. Opening into the intestine is of frequent occurrence (30 per cent.), and is the most fatal of all terminations, three out of five women dying. 8. It is imprudent to treat these cases by expectation, unless, indeed, the cyst is small; and even then it should be at once evacuated, when there are symptoms of an opening taking place, such as sudden change in the health, fever, rapid emaciation, the disappearance of fluid from the cyst, local signs of reaction, and especially diarrhœa. 9. When there is time to wait, it is best to open the cyst at different stages, caustics being often preferable to cutting instruments. 10. If we have the choice of the place where the aperture is to be made, this should be in the abdominal parietes; but if Nature has commenced the eliminating process at any point, it is there we must act, and that as promptly as possible, especially if this be the intestine.—*Med. Times and Gaz.*, August 17, 1861, from *Gazette des Hôpitaux*, 1860, No. 110.

43. *Labour Twice Prematurely Induced on a Dwarf with Distorted Pelvis.*—Dr. E. A. Kirby read before the Royal Med. and Chirurg. Soc. (Feb. 26th, 1861) an account of a case of this kind. The subject of it was a dwarf of singularly small stature and ill development. In infancy she had rickets, and her osseous system was considerably distorted by the inroads of that disease; but it appeared that some other members of the same family were also very diminutive in stature and development, who nevertheless were exceedingly well proportioned, and apparently free from disease. Therefore, apart from the distortion consequent upon the rickets, she was no doubt a true dwarf. When first seen by the author, in the early part of 1858, she was twenty-seven years of age, had been married twelve months, and had completed her thirty weeks of uterine gestation. She presented a strumous aspect, and her general health was indifferent. On a careful examination, the spinal column and pelvis were found to be greatly distorted. The former from the last cervical to the union of the last dorsal and first lumbar vertebræ, measured fourteen inches, and presented

three curvatures, two lateral and one angular forwards. This latter curvature involved the whole of the lumbar and the last dorsal vertebræ, the bodies of which were thrust forwards, downwards, and to the left. The pelvis was contracted in all its dimensions, and slightly flattened from before backwards; the promontory of the sacrum and last dorsal vertebra projecting forwards to the pubis, narrowing the antero-posterior diameter of the upper outlet to rather less than two inches and a half. Natural labour under these circumstances being impossible, the choice of operations lay between craniotomy and the induction of premature labour. The latter was determined upon, the time chosen being the thirty-second week of gestation, but it was delayed for a week owing to the patient suffering from bronchitis, and was only completed at about the thirty-fourth. Induction of the labour was commenced on January 30, and she was delivered on February 7. On rupture of the membranes, the elbow was found in the vagina, and the shoulder resting on the brim of the pelvis, the child lying transversely. This embarrassing presentation was converted into a footling by turning, and in about twenty minutes the little patient was delivered of a living child. Both progressed favourably, and in a few weeks the woman returned to her usual avocations perfectly well. In this case about two ounces and a quarter of ergot was employed with the most useful effect, and without occasioning the least bad symptom in mother or child. A few months later this little dwarf, nothing daunted by her past experience, again became *enceinte*, and having completed her seventh month, applied to the author, who again induced premature labour. This time, however, owing to the lateness of her application, and to the labour proceeding more slowly than in the first case, the delivery was not effected until she had completed her eighth month of uterine gestation, two weeks later than in the previous case, and the fœtal head had attained a degree of development incompatible with its safe passage through so contracted an outlet. The child was therefore lost, but the parent recovered as rapidly as before, and she has not since been pregnant. Her first child has by this time grown nearly as tall as herself. The means employed to induce both labours were fully described, and present several points of interest. On remarking on these cases, the author laid much stress on the value of the operation, and its great superiority to craniotomy, in which operation 1 in 5 mothers dies, while in induction of premature labour 1 only in 50 dies; and half the children are saved. The success of the latter operation he thought greatly depended on keeping the membranes entire until the os uteri was fully dilated, and he reprobated the rupture of them as a means of inducing labour, it being most dangerous to the life of the child, and seldom if ever required.

The paper was accompanied by excellent stereoscopic photographs, taken by Dr. Wright about a fortnight before the last delivery; and, although not the first application of photography to medical science, this is probably the first paper that has been read to the society so illustrated.

Dr. Greenhalgh had had considerable experience in connection with deformity of the female pelvis. He had had occasion to perform Cæsarean section twice, and to induce premature labour five times. He could support Dr. Kirby's opinion as to the value of ergot, as he had used it in the five cases of premature labour he mentioned, and with the best effects. He had never seen, and did not believe that any injurious effects to the child were ever produced by the drug. In cases in which the child was born dead after the administration of large doses of ergot it was reasonable to suppose that death was caused by the long and difficult labour which had rendered the use of the ergot necessary for the accomplishment of delivery. He wished to ask Dr. Kirby what means were taken to insure exactness in the measurements he had detailed, and if chloroform was used, which he remarked was a very important aid? He (Dr. Greenhalgh) remembered a case which occurred at the Middlesex Hospital, which bore on the subject of discussion. A woman had been sent to the hospital, in order that Cæsarean section might be performed. The case was carefully entered into by Dr. Hugh Lee and Dr. Merriman's father, and it was agreed that Cæsarean section was the only method by which the child could be delivered. Arrangements were made for the operation, and the instruments were got together; and when all was ready, the child was born alive. Mr. Greenhalgh dwelt on the great difficulty in arriving at an accurate estimate as to the diameter of the pelvis; and had frequently found that very able men differed considerably in the results they had arrived at by examination of the same case. He was asked lately to perform Cæsarean section, but not considering the case calling urgently for immediate delivery by such a severe procedure, he waited several days; he then succeeded in delivering the patient by the aid of the long forceps. The child was putrid, and had evidently been dead some time.

The author stated that he had obtained his measurements by the aid of the finger, and that Mr. Foster, who saw the case with him, had by the same means formed the same estimate. He considered that there were circumstances attending the second case, which confirmed the opinions he had then formed. The labour had in this instance been delayed two weeks longer. The breadth of the head after delivery was only two and a half inches.

Dr. MERRIMAN wished to ask the author why the injection of warm water was not used as a means of exciting premature labour?

Dr. WYNN WILLIAMS stated that there were cases on record, in which, during the attempt to inject the uterus with warm water, air had entered the veins, and instant death had resulted.—*Med. Times and Gaz.*, March 9, 1861.

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44. *A Practical Inquiry whether the Ergot of Rye, when administered to the Mother during Labour, is Dangerous or not to the Life of the Child?*—Dr. R. UVEDALE WEST read a very valuable paper under this title before the Obstetrical Society of London (July 3, 1861).

In December, 1855, the author published the particulars and results of an inquiry similar to the present—to the effect that, in a series of 69 cases in which he had administered the ergot of rye on a gross total of 278 labours, 9 children were stillborn, viz., 2 putrid at birth; 2 born after labours which were preceded and accompanied by hemorrhage; 1 born footling, with hydrocephalic head, and consequent fatal compression of funis; 1 in which there was evidence of latent compression of funis; 1 a difficult primiparous forceps delivery; 1 a difficult vectis delivery, the mother seriously ill from excessive œdema; and 1 born dead without any assignable cause. In consequence of certain criticisms on this paper which were published in France, accounting variously for the results, and challenging the author to continue the inquiry on the same plan, one of the critics, Dr. Danyau, on the part of the Imperial Academy of Medicine, maintaining that, unfavourable though the results appeared to be to him, yet a similar report on a like number of cases would probably be more unfavourable still, Dr. West continued to tabulate his ergot cases as he had begun, with the results which he now begged to lay before the Society:—Between December 23, 1855, and June 22, in the present year, on a gross total of 734 labours attended by the author, the ergot was given in 172 cases, including 1 case of twins, so that there were 173 children born under the effects of ergot of rye. Of these, only 5 were stillborn from all causes—viz., 3 putrid at birth; 1 with placenta prævia and profuse hemorrhage—premature; and 1 with prolapsed funis, detected an hour after the ergot was given, the operation of turning, which was then immediately performed, having been too late to save the child's life. The author urged that, in reply to Dr. Danyau's precise challenge, he might fairly have rested contented with the results of the first 69 cases of this second series, in which there was not a single stillbirth from any cause; but he considered that that fact, when compared with the unfavourable result of 9 stillbirths in the preceding series of 69 ergot cases, proved only that 69 was too small a number to form a correct conclusion from, and therefore he went on with the inquiry until it was spread over a gross total of 1013 labours, on which number the ergot was given in 241 cases. Of that number of 241 ergot cases, including 242 children born, there were, adding the 9 of the first series to the 5 of the second, 14 stillbirths from all causes—viz., 5 putrid at birth; 1 footling; 1 prolapsed funis; 3 hemorrhage during labour from placenta prævia; 2 difficult instrumental deliveries; 1 suspected latent compression of the funis; 1 cause not manifest. On the whole number of births—1013 labours, and 1029 children born, including the series without ergot as well as that with ergot—there were 50 stillbirths, of which 5 were born dead without any manifest cause. So that, inasmuch as only 1 of those 5 was born under the influence of ergot, that medicine having been given in the greater proportion of 1 in 4¾ of the whole number of labours, the author thought there was no sufficient evidence in the facts he had accumulated to justify the doctrine that ergot of rye was dangerous to the life of the child. As to the mother, the author found the following results on a retrospect of the gross number of 1013 labours—viz., 7 deaths within the lying-in month, of which one occurred with a patient who had had ergot of rye; 18 cases of incarcerated placenta, of which 5 were after ergot of rye; 25 instances of post-partum hemorrhage, of which 5 were after ergot of rye; 30 cases of puerperal disease or disorder, of which 9 were after ergot of rye. So that he was led to the conclusion that ergot has little or no influence in either causing or preventing parturient or puerperal accidents or diseases. At the same time he wished to remark, that probably in proportion as ergot might improve uterine action, certain accidents which depended on deficient uterine action, such as post-partum hemorrhage and after-pains, might be controlled by ergot of rye. The author concluded his paper with the observation that the tables before the Society appeared to prove that it was immaterial in what stage of the labour the medicine was given; whether the os uteri was rigid or supple; whether the liquor amnii was or was not evacuated; or whether the mother was multiparous or primiparous; but that it was essential that actual labour should be present, as well as that the accoucheur should be competent to meet any emergency that might arise, just the same as when ergot has not been given; that ergot was useful wherever it was desirable to improve uterine action; and that it could be dangerous only where uterine action would be dangerous, as, for example, in a case of arm presentation after the liquor amnii was evacuated, as then it would make turning more difficult.—*Med. Times and Gaz.*, July 20, 1861.

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45. *Numerous Cæsarean Operations by one Practitioner.*—Dr. Winckel, of Gummersbach, near Cologne, practising among a rural population living in a very wretched hygienic condition, and very subject to osteomalacia, has had occasion during nineteen years to perform the Cæsarean operation, on account of deformed pelvis, *thirteen* times, the deformity arising from osteomalacia in eight, and from rickets in five instances. In four of the cases gastrotomy was required only, as, in consequence of rupture of the uterus, the children lay in the cavity of the abdomen. This occurred twice in one woman, who had already once before undergone the operation. Of these three women two recovered; and, in fact, the issue of the operations must be regarded as favourable, seeing that six of the women lived, one of them having been operated upon three times, and therefore giving a proportion of eight recoveries to five deaths. After the operations, which were performed under chloroform, opium was given, and no inflammatory symptoms ensued.—*Med. Times and Gaz.*, July 6, 1861, from *Monatsschrift für die Geburtskunde*, vol. xvi.

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46. *Simple Treatment of Lacerated Perinæum.*—M. Hervieux says, that he has in several cases successfully treated laceration of the perinæum in females by the retention, in contact with the part, of a sponge dipped in a solution of chloride of zinc, in the proportion of one part to from ten to fifteen parts of water. The sponge is renewed four or five times a day, and is held in its place by a piece of waxed cloth, and a few turns of a bandage. The sponge, M. Hervieux says, imbibes the secretions, while the chlorine exerts on them a neutralizing and solvent action. Reparation is thus enabled to take place gradually; and the ultimate result is complete cicatrization. Two cases are recorded in illustration.—*L'Union Médicale*, May 16th.

MEDICAL JURISPRUDENCE AND TOXICOLOGY.

47. *Poisoning by Strychnia applied to the Punctum Lachrymalia.*—Dr. Schuler relates the following interesting case which occurred in Langenbeck's prac-

tice. In a case of amaurosis, in a man fifty years of age, about the twelfth of a grain (less than five milligrammes) of pure strychnia was introduced by means of an ear-pick into the *punctum lachrymale;* but as during this manipulation a portion of the powder was lost, about three milligrammes only entered the punctum. Three or four minutes had not elapsed when the patient's face became livid, and he was seized with spastic yawnings and vertigo. Free admission of air and cold aspersions were had recourse to, and "lavements" (!) were administered. The symptoms continued to increase, as shown by loss of speech and pulse, convulsive respiration, and violent tetanic shocks. Death seemed inevitable, when the severity of the symptoms abated, and after a copious evacuation of urine and feces, all had passed off in less than half an hour. From this fact it is evident that death might be rapidly caused by depositing in the corner of the interior of the eye from 5 to 15 centigrammes of strychnia or salt of strychnia; and supposing the remaining adherent powder to have been cleaned away, the detection of the cause of death might become a matter of extreme difficulty.—*Med. Times and Gaz.*, July 20, from *Gazette Médicale* de Paris, No. 6.

48. *Influence of Lead Poisoning on the Fœtus.*—M. C. PAUL, in continuation of former researches (see No. of this Journal for Oct. 1860, p. 567), relates two additional cases, showing the great liability of women to abortion who have to work amid a saturnine atmosphere, as in polishing type and the like. He has now examined 89 individuals with reference to this point, and of these 31 have become pregnant while exposed to the action of lead. These women furnished 141 pregnancies: of these 82 proved abortions, in 4 labour was premature, in 5 the children were born dead. Of the children born alive 20 died during the first year, 18 during the second, 7 during the third, and 1 still later. Fourteen of the children are still living, 10 only having passed their third year.—*Med. Times and Gaz.*, July 20, from *Gaz. Méd.*, No. 10.

49. *Overdose of Croton Oil—Recovery.*—Dr. J. BRYDON relates (*Edinburgh Med. Journal*, Aug. 1861) the case of a girl, 19 years of age, who took by mistake a teaspoonful of a liniment composed of equal parts of croton and olive oil. When seen by Dr. B. about half an hour afterwards, complained of an intense burning sensation in the throat and all down the œsophagus, but had no pain in stomach. Her pulse was 84 and feeble, nearly the same as in the morning, and the temperature of the surface was unaltered. Dr. B. immediately caused her to drink a considerable quantity of warm water, and sent for a full emetic dose of sulphate of zinc. Before the zinc was procured, she had commenced to vomit: but to make sure, it also was administered. The vomiting was now continued and severe, and was further encouraged by additional large quantities of tepid water. The *ejecta* contained, in addition to the water swallowed, a considerable amount of bile, and also a little of the remains of a scanty meal she had taken three hours before; they tasted strongly at first of croton oil. After the vomiting had continued for a quarter of an hour, she began to complain of severe pain in the stomach, not aggravated, however, by pressure. She was ordered an enema, consisting of thirty drops of tincture of opium in a tablespoonful of starch, with directions to have it repeated in an hour.

Dr. B. saw her again at half-past eleven. The bowels had been very freely opened about ten, and again at eleven; but the vomiting had ceased. The pain had considerably abated in the stomach, but was now very severe at the lower part of the bowels; but at neither place was it increased by pressure.

In a day or two she was as well as before the accident.

AMERICAN INTELLIGENCE.

ORIGINAL COMMUNICATIONS.

Recurrent Fracture of the Patella; successful employment, for the second time, of Malgaigne's Hooks. By John H. Packard, M. D., of Philadelphia.

In the April number of this journal, I recorded a case of transverse fracture of the patella, which had been successfully treated by means of Malgaigne's hooks. The accident, a fall down a staircase, occurred on the 28th of November last; the hooks were applied on the eighth day, and were retained in place for thirty-one days. By the first of February, the patient was walking in the street, and two months afterwards, as she subsequently told me, she could have waltzed as well as ever she could in her life.

On the 9th of April, Mrs. J. sustained a strain of the left knee (the one previously injured), and on the 10th, catching her foot in the carpet, she felt something give way with a crack in front of the joint. She did not send for me till the succeeding evening, when I found the fracture evidently reproduced, the two portions of the bone being about three-fourths of an inch apart.

For two or three days the limb was simply kept on a pillow, with adhesive strips so applied as to diminish the gap between the fragments. On the 14th, I placed it on a posterior splint, and on the 17th, I re-inserted Malgaigne's hooks, as nearly as possible at the same points as before. The pain caused by the operation subsided in a few minutes, a rag dipped in a mixture of equal parts of lead-water and laudanum being placed on the skin; and the patient lay in perfect comfort during the remainder of the day. At the end of twenty-nine days, the instrument was removed, without having caused any inflammation or irritation. But, whether from a want of due activity in the tissues, or from some other unknown cause, union was not so firm after this second fracture as after the first.

At the present writing, eighty-six days since the instrument was removed for the second time, Mrs. J. walks about with great ease, and with as perfect a sense of security as could well be expected in view of her past experience. When she goes up or down a staircase, a slight halt is perceptible, but otherwise she neither feels nor exhibits any abnormity of gait. The gap between the fragments does not exceed half an inch.

I would call attention to the fact, that when the bone gave way for the second time, it was with a sharp crack, and that when the finger was applied at the seat of injury, the separated fragments were not felt to be smooth and rounded, as if a fibrous bond between them had been ruptured, but abrupt, like those of a common fracture. From these circumstances, and from the closeness of the coaptation maintained by the hooks, my own belief is, that bony union had actually occurred. At all events, the issue of the second course of treatment could hardly have been rendered more successful under any other method of treatment.

(In the description of M. Malgaigne's instrument, given in connection with the history of this case in the April number of the *Journal*, the thickness of the plates was inadvertently stated to be a quarter of an inch; it is, in fact, not quite one-eighth of an inch.)

Case of Coccyodynia cured. By A. GODFREY, M. D., of Sonora.—A few weeks ago I met with a case of coccyodynia of ten years' standing, in a woman, about 32 years of age. She suffered very severe pains in the region of the coccyx, whenever she attempted to sit down or to resume the erect posture, or to walk about. She could not lie down in bed or rise from it without the assistance of some one of her family, nor was she able to sit down on and to rise from a chair without taking hold of the back of the chair or some other object. Still, the least painful posture for her was to keep bent to a certain degree, as if in the act of sitting. While sitting on a chair and lying on her bed, she experienced a very disagreeable, dull, burning, and prickling sensation, which was frequently unbearable. She suffered excruciating pains when her body was swayed from side to side; the gluteal and coccygeal muscles of both sides seemed mostly to trouble her, but especially on the right side, to which the coccyx was somewhat drawn. She dreaded to sit down, and dreaded to rise up—dreaded to get into bed, and dreaded to get out of it. As she did not complain when her bowels were being moved, the tendons of the sphincter, and the fibres of the levator ani, did not appear affected, the disease seemed to be mostly confined to the gluteal and coccygeal muscles, and also perhaps to the sacrosciatic ligaments, which produced traction. The patient states that she cannot tell how the affliction came on, and what caused it. She relates that she consulted a dozen of the best physicians in Tennessee (where she used to live), under whose treatment she successively was for a good while, without deriving any benefit from it, and finally they pronounced her incurable.

Whilst I was attending on a member of her family, she told me her affliction; and the symptoms of coccyodynia, as described in the lectures of Professor Simpson, which I had read in your *Monthly News and Library*, were so striking and plain in her case, that I offered to cure her. I proposed to perform the operation recommended by Professor Simpson, the isolation of the coccygeal bones from the surrounding tissue by means of a tenotomy knife (see *Simpson's Clinical Lectures on Diseases of Women*, Am. ed., p. 216), to which she readily consented. I performed the operation on the 18th day of April last. The relief was effectual, instantaneous, perfect, and I hope permanent. The wound is healed up, and she feels very well. The patient continues to be perfectly free of pains.

Case of Triplets. By JAS. W. PITTINAOS, M. D.—I was called on the 6th of November, 1860, about half-past four o'clock P. M., to see Mrs. O'C., in labour. This was her sixth pregnancy. When I arrived, the child had been born two or three minutes; it was a girl, and weighed, about four and a half pounds; it was quite vigorous for its size. After having attended to it, I requested the mother to bear down, to facilitate the expulsion of the placenta at the next pain. She did so, and a boy was expelled with the membranes entire. A woman who was present informed me the first child was born in the same condition. This boy weighed nearly three and a half or four pounds. The circulation being feeble, I sprinkled cold water upon the child, and immediately it began to cry. In a few minutes it became very lively; it was weaker than the first.

I waited again for the expulsion of the placenta, but was disappointed, as in a few minutes another boy came forth with the membranes, like the two preceding, entire. This child was remarkably pale and weak. I treated it in the same manner as the other boy, and had the satisfaction to see it improve very much before I left the house. It was, however, the least vigorous of the three.

The placentæ, two in number, were expelled in five minutes after the birth of the last child. The boy and girl first born were attached to the larger placenta, and the last boy to the smaller, which was the last expelled. The children were all doing well when I left the house. For the mother, I ordered the ordinary camphorated solution of sulphate of morphia, two grains to the ounce, of which she was to take a teaspoonful every two hours until sleep was induced.

The expulsion of the children and placentæ did not occupy more than twenty minutes. The woman never had a plural birth before; her husband's sister had twins on one occasion.

Nov. 7th. Saw Mrs. O'C. this morning at ten o'clock. She had passed a comfortable night; this morning, however, she was seized with nausea and vomiting. Great prostration followed, and I found her hardly able to speak. I prescribed for her a half grain of opium, conjoined with one of calomel, every two hours, intending to see her in the evening.

This woman had no milk, but a neighbour who had been recently confined was suggested to me as a person who would nurse the children temporarily. I had, therefore, ordered the woman who acted as nurse to apply to her, but she neglected to do so. The children being naturally weak, having been without food for fourteen hours, and also poorly clad, were cold and debilitated; in fact, the fingers of one were blue with cold. I insisted on their being fed, in no gentle tone, before I left.

I called in the evening to see them, but the gentleman who had been engaged to attend the woman had taken charge of the case. I would have weighed these children, and suggested it to the mother, but she gravely informed me "she never had but one weighed, and all the children were healthy but him, and he had had a *sore neck* ever since." Of course, I urged the matter no further. The parents were wretchedly poor.

11th. I have since learned all the children are dead. The boys died on the 8th—one in the morning, the other at night; the girl died on the evening of the 9th. If these children had been properly cared for by the parents, the result might have been different.

PHILADELPHIA, December, 1861.

DOMESTIC SUMMARY.

Vesico-Vaginal Fistula; Spontaneous Relief. "The American Operation."—[Read before the Obstetrical Society of Boston, by B. E. COTTING, M.D., Cor. Secretary of the Society.]

VESICO-VAGINAL fistula has been justly called a lamentable accident. Its consequences are truly deplorable; the remedy difficult, and, until recently, very uncertain. Spontaneous recovery, a result hardly to be hoped for, is a mere possibility. As an instance of such unexpected good fortune, the following case seems worthy of record.

In January, 1844, the patient, aged 33 years, was delivered of a first child, after a labour of five days without intermission. On the third day her medical attendant left her, because she would not allow the forceps to be used. After he left, she got no attendance until the last moment of her labour, when she had the assistance of a midwife. During the five days she was not conscious of having passed any urine. Before the removal of the placenta, the water was drawn, and the catheter was used at proper intervals afterwards. On the third day after delivery, however, she found that she had no control over the bladder. After this, all the urine came away involuntarily and without cessation.

Having been called at this stage of the case, I found a sloughy opening from the vagina into the bladder, nearly an inch above the neck of the latter, large enough to admit the tips of two fingers. The catheter passed readily from the bladder into the vagina. The nature of the case, thus clearly made out, was explained to the patient; and she was informed that, after her recovery from confinement, means for permanent relief might be tried with reasonable chances of success. From time to time thorough explorations were made; and the case on the whole was considered a promising one for a surgical operation.

This was in 1844, and I was led to take this view of the matter, because I had been either an observer or an assistant at most of the operations for this accident performed previously, or about that time, by Dr. George Hayward, Sen., of Boston. But the patient resolutely refused to submit to any operation, in spite of earnest and repeated persuasion, and at length declined all further interference; having, from the first, allowed examination very reluctantly. All unusual interest in the case therefore subsided; and for a long time after, nothing was heard of the patient, except that she was in a wretched condition.

Seventeen years having passed, I accidentally, a few days ago, met with this patient, and obtained from her some particulars of her history subsequent to her misfortune.

She had never been pregnant since, though she says that she knows of no reason why she should not have had other children. For three years or thereabouts, after the accident, she was unable to retain the least accumulation of urine, the dribbling having been constant and unceasing. In a word, she suffered all the discomforts and loathsomeness ordinarily attendant upon such accidents. She afterwards began to experience some slight power of retention, and this continued to increase, very gradually, until she had almost or quite acquired complete control over her urine. For the last three or four years, and since her catamenia have ceased, she has been able to retain and pass her water, as she says, "as well as any body." She goes to church and other public places without apprehension, though after several hours she sometimes feels uneasy and fears consequences. She has not, however, suffered from too long retention up to this time. She affirms that she is completely restored, and perfectly well.

On partial digital examination, which she very reluctantly permitted, there were noticeable deep corrugations and contraction about the place of the former opening; and the upper part of the septum appeared to overlap the under. No communication with the bladder could be discovered by the finger; but whether it was completely obliterated, or, if any, how large the opening might be, could not be ascertained with absolute certainty, as she repelled the introduction of the catheter—seizing the instrument and preventing further exploration. At any rate, the injury has been completely repaired, and the patient relieved of her miserable state and restored to a comfortable existence.

In looking up and reviewing a case like the foregoing, which terminated so fortunately, one is naturally led to reflect on the great difficulties formerly attendant on efforts to remedy such accidents, and to call to mind some of the circumstances of the earlier operations performed by Dr. Hayward, particularly those original and scientific devices of his, which have rendered subsequent operations so much more successful; and which, having been accepted by such men as Professor Verneuil and M. Robert, of Hôtel Dieu, have given to the method abroad the name of "The American Operation."

An account of some of these improvements is worth repeating—for their own intrinsic value, and more especially now as they do not seem to be fully appreciated or properly acknowledged by some, whose success, whatever it may be, should be attributed to the more or less complete adoption of these improvements; and moreover as, in certain localities, they appear to be in danger of being overlaid by accumulating heaps of pretended discoveries and inflated assumptions.

Bearing in mind that when the first case presented itself to Dr. Hayward, in 1839, there had not been a successful operation in this country, and very few anywhere; that little or no assistance in the details of such an operation could be obtained from any source; that troublesome and alarming symptoms had arisen from sutures carried through the walls of the bladder, as previously thought necessary; that danger and even death had occurred from hemorrhage —bearing in mind these and other formidable obstacles on the one hand, and the confessedly slight chance of success on the other, we shall have a better conception of the great service Dr. Hayward rendered, in planning and executing, on strictly scientific principles, a *new*, *safe*, and *successful* method of operating for the relief of this accident.

And first, by passing a large, smooth, and inflexible staff through the urethra beyond the fissure towards the fundus of the bladder, and using this staff as a lever, the pubes being the fulcrum, he showed that the bladder could be brought forward until the fistulous opening came quite within reach and sight. This movement originated with Dr. Hayward. It can be effected without difficulty; and, even before the use of ether as an anæsthetic, caused no very considerable amount of inconvenience or pain. Now, of course, whenever ether is resorted to, the last and only objection is entirely obviated.

The parts having thus been rendered accessible, Dr. Hayward's next and chief improvement consisted in superficially but thoroughly paring the edges of the fistula without cutting deeply into the walls of the bladder, and more particularly in dissecting or splitting up the vaginal membrane around the opening for the distance of a few lines, in order to have broader surfaces to be placed in contact; thereby increasing the chances of adhesion, while the danger of hemorrhage, the result of deeper incisions, was greatly diminished. In fact, the bleeding was in this way reduced to the merest trifle, and the loss of substance, always to be avoided, rendered so inconsiderable that it need not be taken into account.

A third and very great improvement, introduced by Dr. Hayward, was the passing of small sutures; and these through only a portion of the thickness of the pared parts—not through the walls of the bladder. Thus, inflammation of this organ, as experienced by previous operators, was completely averted.

In his first cases, Dr. Hayward removes the stitches a few days after the operations; but having in one instance, at least, which I happened distinctly to witness, reopened an already united wound by pressing too suddenly on the staff in his endeavour to get at the most distant suture, he allowed in some of his subsequent operations the threads to remain until spontaneously cast off. Left in this way, the threads caused no trouble whatever, usually coming away in from seven to ten days. In one instance one remained twenty-eight days without inconvenience or injurious effect—so that this course may be adopted whenever it may be difficult to reach or to remove the stitch.

As so much has been said, from time to time, since the publication[1] of Dr. Hayward's method and success—now on the varied contrivances for securing and retaining the sutures, again on their number and size, and still more on their material, till "lo! a new era dawns"! and we have "the great surgical achievement," "the imperishable discovery" of the silver suture (though unfortunately for our country's vaunted glory in the matter, this "result of a Providential train of circumstances" occurred fifteen years after silver sutures had been in use in England, been advocated there on precisely the same grounds, and even been employed in a successful operation for vesico-vaginal fistula, as reported in vol. xxx. of the London *Lancet*); and as there is no little danger in all this clamour about clamps, buttons, shot, and other equally unimportant mechanical contrivances, that the true scientific principles, which should guide in these operations, may be overlooked or disregarded—it may be well to remark in a word, and it needs but a word, that, wherever union by the first intention is looked for, the edges of the wound must be kept in close contact; and that, if this be skilfully done, it is of far less consequence by what peculiar contrivance it is effected. If sutures are used, more depends upon their proper adjustment, and their having the exact amount of tightening requisite, than upon the material. A metallic suture, of whatsoever or whomsoever's make, if imperfectly secured or too tightly tied, will prove as ineffectual or will cut its way out as certainly as that made of silk or flax. A delicate thread, even of cotton, properly adjusted, will retain its place, cause as little irritation, and leave as small a scar, as we have often had occasion to notice in operations about the face, as the purest silver, the softest iron, or the most polished steel. Let each operator, then, use whichever suture, knot, or fastener he himself chooses or can, in a given case, best manage, just as he would select any particular form of scissors or knife for paring the opening; but let him not forget the principles on which he must depend for success. The former, though perhaps not the best, may answer if adroitly used, but a neglect of the latter will result in inevitable failure. And having, by such a course, been successful, let him not, in his report of the case, as is too often done, wholly ignore the first demonstrator of these principles—an act of simple justice; while magnanimity would suggest an honourable mention.

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[1] American Journal of the Medical Sciences, Philadelphia, July, 1839, vol. xxiv. p. 283. Boston Medical and Surgical Journal, April 16th, 1851, vol. xliv. p. 209.

The position of the patient during the operation is of some consequence, though it may occasionally be varied to suit the convenience, or even the whim, of the operator. Dr. Hayward adopted that of lithotomy, which has many advantages. The fistulous opening, naturally thrown forward by this position, can thus without difficulty be brought by the staff nearly or quite to the os externum, and the subsequent steps of the operation thereby greatly facilitated. In this way too, an assistant, on either side, can with one hand keep the leg in proper position, and with the other separate the labia with a suitable spatula, without being in the way of the operator, who stands in front of the patient. Besides, the patient is in the most comfortable posture for a prolonged operation, and can thus take ether when and as long as desirable.

The catheter for after use, contrived by Dr. Hayward, is, to say the least, quite as good as any of its imitations; while its advantages are the plate which enables it to be secured by a bandage, and the screw which allows the additional portion to be turned in any desired direction, or to be removed at pleasure.

Much more might be added, but enough has been said for the present purpose, which is, simply, a short exposition of the principal improvements, based on which, the operation for vesico-vaginal fistula is hereafter to become one of the successful operations of surgery. Having had the opportunity to be present and to assist in the earlier cases, I can bear testimony to the difficulties encountered, and to the original as well as successful means adopted to surmount them —a grateful testimony to the merited eminence of a faithful instructor and steadfast friend.—*Boston Med. and Surg. Journ.*, July 11, 1861.

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Affection of Vision from Spinal Irritation.—The following cases, related (*Berkshire Medical Journal*, July, 1861) by Dr. A. H. Robinson, of Concord, N. H., are highly interesting, though so far as we can judge, from the very imperfect account of the symptoms, the disease from which the patients suffered, seems to be improperly designated amaurosis.

"About two years ago, my attention was called to the case of two young ladies—sisters—who, while attending school at an institution in this county, were both attacked with symptoms of *amaurosis;* which became so severe as to force them to leave school, and live secluded from the light. At the time of my first seeing them, these girls had been some months under treatment, and their health had in a measure improved. *The lower cervical and upper dorsal vertebræ in each were exceedingly tender on pressure;* and as this tenderness abated under local treatment, the pain in the eyes and the intolerance of light subsided; and as the soreness of the spine increased, so did the amaurotic symptoms; and thus the one appeared to be the mark of the severity of the other.

"A few months after seeing these young ladies, my own son, a lad of eleven years of age, attending one of the schools in this city, began to complain seriously of his eyes. They 'watered' badly, and at times flashes of light darted through them, while the words of his book so ran together that he could not read. The intolerance of light was such as to prevent his enduring a bright sun, or the light of the gas in his room; and the pain in the eyes was so severe, even in the dark, as to prevent his sleeping. His appetite failed, he became emaciated; and the somewhat dilated, but mobile pupils, the drooping eyelids, the pallid countenance, and, in short, the general aspect of the case was so much like the two first, that from curiosity I examined his spine, and found in the same place the same excessive tenderness as in the others. I then took him from school, forbidding his looking at a book, and kept him secluded from all bright light. I applied croton oil to the spine, and gave him blue mass as an alterative, while he took thrice, daily, lupuline and rhubarb, with super-carbonate of soda. This was the main medicinal treatment, and as the irritation of the spine began to abate, the amaurotic symptoms diminished. He could not, however, for nearly or quite a year, read fine print, without the aid of glasses suitable to persons fifty years of age, although words printed in a large, coarse type were readily made out. In about fifteen months after commencing treatment, my son returned to school, and now he can read the finest print without difficulty, and without the aid of glasses, has no pain of the eyes, no unnatural appearance of the countenance, and is able to maintain his rank in his class with fair credit to himself. I consider him cured of his amaurosis."

Action of Chloroform on the Blood—Probable Causes of its Fatal Effects when inhaled as an Anæsthetic.—Dr. Chas. T. Jackson makes some interesting remarks on this subject (*Boston Med. and Surg. Jl.*, March 28, 1861). Six years ago he published a case of death in a healthy young woman, in whom death was produced from inhaling chloroform, preparatory to the extraction of a tooth. The blood taken from the right side of the heart was analyzed, and was found to contain formic acid in considerable quantities, but no chloroform in an undecomposed state. Microscopic examination of the blood, by Dr. J. Bacon, showed that the blood-globules were withered up in a very remarkable manner. Chlorine was also found to be a component of the blood. It was also observed that this blood did not coagulate, nor did the blood-globules subside, but the whole remained a solution, the blood having a cranberry-red colour, like red ink.

Dr. J. states that this blood has been kept in a vial in his office, exposed to temperatures from the freezing point to above 80° for more than six years, and yet it has not decomposed, nor has a single blood-globule settled to the bottom of the vial, nor has the colour changed in the least.

He now calls attention to these remarkable phenomena, which he thinks appear to throw some light on the chemical action which chloroform exerts on the blood. As he views the matter, he considers the chemical action on the blood by inhaled chloroform to be this: "Chloroform consists of one equivalent of formyle and three of chlorine. Formic acid consists of one equivalent of formyle and three of oxygen. When chloroform is inhaled into the lungs, the oxygen is abstracted from the blood, and combining with the formyle makes formic acid, while chlorine combines with the blood as a substitute for oxygen. Thus a portion of the blood becomes chemically changed, disorganized, and rendered unfit for its vital functions. Then, if that portion of the blood contained in the heart, and large vessels, which we may style the immediate working blood of those organs, is vitiated, so as no longer to be an appropriate stimulus to the most vital organs, sudden death is most likely to take place through cessation of their action. Our only surprise should be that death does not more frequently follow from inhalation of this dangerous anæsthetic agent, for the decomposition I have described undoubtedly always takes place to a certain extent, and to a sufficient degree to deoxidize a considerable portion of the blood, and to charge it with chlorine and formic acid.

"It is well known, that deaths more frequently take place in cases where chloroform is administered in minor surgical operations, or in cases where there is no loss of blood, than in larger and bloody operations.

"This I think admits of an explanation in the fact, that where there is large hemorrhage the vitiated blood, or a portion of it, is removed and is replaced in the vital organs by blood coming from other parts of the body, where it has been but little acted upon by the chlorine—a new working blood being drawn into the large circulating organs, which are thus enabled to continue their proper action, and to supply the brain with its appropriate stimulus. This hypothesis appears to me to cover the cases thus far reported, and I offer it for the consideration of physiologists.

"The great disadvantage under which chloroformization labours, is the introduction of chlorine, as such, into the composition of the blood. This we know to be destructive of the blood-globules, and an actual poison in the system.

"We naturally inquire how this vitiated blood is got rid of, for it evidently never can be re-organized in the circulation. It is undoubtedly thrown off as so much effete matter, by the secernent and excretory organs, and chiefly by the kidneys. Hence, in a large majority of cases, the patients recover with but little damage to their health, though there is always a degree of prostration in most if not all cases of chloroformization.

"It is obvious that we may much diminish the danger in employing this agent, by mixing with it a large proportion of pure ether, say at least three-fourths of its bulk. By this means we not only dilute the dangerous with a perfectly safe anæsthetic agent, but add the stimulus of ether to overcome the deadly, depressing effects of chloroform. The object in allowing any addition of chloroform to ether, was to obtain a less bulky and more powerful agent than pure ether alone, and to afford greater facility in carrying an anæsthetic agent into the field of battle. It was, therefore, recommended by me, and was used in the French and Sardinian armies of the Crimea, with great success and safety, while chloroform, which was employed by the English surgeons, produced many fatal accidents. Still, in cities and at home, or in hospitals, I should always prefer pure washed ether, as it is known to be a safe and sure anæsthetic agent, though it is somewhat bulky. However, from my own experience and observation, I must say I never have known any fatal or even inconvenient effect to result from the employment of the mixture of chloroform and ether in the proportions I have named."

Inversion of the Uterus.—Prof. JAS. P. WHITE relates (*Buffalo Medical and Surgical Journal*, August, 1861) an interesting case of this to which he was called by Dr. T. T. Lockwood. The subject was in her 23d year, of small stature, and the mother of two children. Nothing unusual had occurred in her previous labours, but Dr. Lockwood had remarked that her pelvis seemed remarkably large, and that the second stage of labour had each time been completed with great rapidity. Dr. L. had been called to the patient in her third labour, on the morning of the 8th of December, 1860. "The first stage of labour, during which there were no unusual symptoms present, had occupied a little more than two hours, the patient not being at all exhausted, and was completed a little after 12 o'clock. At this time the membranes ruptured, a large amount of water was suddenly discharged, and with the next pain the child was thrown entirely into the world. Dr. L. immediately slipped the cord, which was of rather more than ordinary length, and once *around* the *child's neck*, but *not tightly drawn*, over its head. Soon after, as the child was crying vigorously, he tied and divided it, handing over the infant to the nurse.

"His attention was immediately called to the mother, whom he now observed to look pale and to be fainting. Upon passing his hand up between her thighs, without having made the *cord tense*, he discovered a large tumour occupying the entire space, which, upon examination, he found to consist of the uterus, with the placenta attached. He immediately detached the placenta, carried the uterus up into the pelvis, entirely out of sight, where meeting with resistance to further reduction, he gave the woman a large draught of brandy and paregoric, and drove up to my house as rapidly as possible.

"Without loss of time I returned with the doctor to the residence of Mrs. R., whom we found surrounded by her friends, who supposed her dying. The woman was nearly pulseless, with all the symptoms of suffering from severe shock present in an eminent degree.

"We immediately administered more brandy, tinc. opium and ammonia, and as she aroused a little and consciousness partially returned, we deemed it best to proceed at once with efforts to reposit the uterus. Upon introducing my hand into the vagina, I found the fundus of the uterus resting upon the perineum, though *entirely covered by the external organs.* Carrying the hand farther up, the inversion was found to be *complete,* and the organ pretty firmly contracted. The left hand placed upon the supra-pubic region, detected a tumour there, which, although not round like the fundus of the uterus might, through abdominal parietes of moderate thickness, not unlikely be mistaken for the normally contracted uterus in its natural position. Gentle continuous pressure was now made by the intra-vaginal hand, whilst with the one upon the hypogastrium the anterior lip was hooked or held by the fingers, and counter-pressure exerted so as to prevent injury to the utero-vaginal connection. In a few minutes the neck began to be reflected upon the body, and although some dimpling or depression could be felt in the fundus, reduction took place from the neck to the body, and finally the fundus following the body up through the neck to its natural position. It should be remarked that, notwithstanding the relaxation of the system consequent upon syncope, and although not more than an hour or an hour and a quarter elapsed from the time of the delivery of the child to the complete *re-position* of the inverted uterus, the organic contraction was so firm as to require considerable pressure to carry the body through the os, and reflect the organ upon itself.

"The patient was now laid in a comfortable position, with the head depressed and stimulants and opiates freely given. She soon began to revive, the pulse returned to the wrist, consciousness was restored, and at 3 P. M., about two hours after the operation, I left her with Dr. Lockwood. The amount of blood lost was not great, and was, in my opinion, utterly insufficient to account for the depression which immediately succeeded inversion, and continued for some hours after restoration. Indeed it is not unlikely that the patient would have lost her life from shock had not stimulants been freely and repeatedly given. The vital energies were so much depressed—the pulse not to be felt at the wrist—and the countenance was so ghastly that we did not venture to make the least effort at restoration of the inverted organ until she had taken stimulants freely. And yet there had been very little blood lost—for several days Mrs. R. remained very feeble, with frequent pulse, and tender hypogastrium, but gradually convalesced. Her restoration has been complete, and she is now in good health, nursing her infant and attending to her ordinary domestic duties."

New Suture.—Dr. W. T. S. Cornett, of Versailles, Indiana, describes (*Cincinnati Lancet and Observer*, Aug. 1861) a modification of the suture proposed by Dr. W. L. Atlee. (See No. of this Journal for Jan. 1860, p. 81.) Instead of the gum-elastic ring used by Dr. Atlee, Dr. C. uses a gum-elastic strap, and he prepares needles of steel wire. His directions are as follows:—

"Take the best steel wire, No. 9, such as is used for piano strings, turn an eye on one end, and point the other by means of a file and whetstone; on the eye I make a head with sealing-wax. These pins can be bent with the fingers into any desired curve, to suit irregular surfaces; are sufficiently strong, and can, after their introduction, be easily cut off at the point with wire nippers.

"*Mode of Operating.*—First, pass the pin through the strap near one end, then pass it through the wound, and so soon as the point emerges on the distal side stretch the strap across and apply it on the point of the pin, then push the pin forward until it is arrested by the head coming in contact with the strap on the proximal side of the wound."

Desquamation of the Cuticle in a Living New-born Child.—Dr. Read said (Boston Society for Medical Improvement) he had attended a woman who was prematurely confined in consequence of having fallen down stairs. The hands and feet of the child were denuded of cuticle, which hung from them in shreds. The child was apparently at the eighth month, and lived twenty-four hours.

There was no other sign of disease. The case showed that desquamation of the cuticle is not always a sign that the fœtus has been dead a considerable length of time.—*Boston Med. and Surg. Jl.*, Sept. 12, 1861.

Removal of Five Inches of the Lower End of the Fibula, from a Boy two years and seven months old; Reproduction of Bone; Cure.—Prof. E. S. Cooper relates (*San Francisco Med. Press*, April, 1861) the following case:—

"Master August. J——, admitted into the Pacific Clinical Infirmary, July 18, 1860, for a disease of the tibia, of ten months' standing. The affection of bone was the result of a very slight injury of the limb, a year previously.

Condition of the parts when operated upon.—The limb was swollen to two or three times its normal size, and at times quite painful. Sinuous openings, leading to the bone, were found in different places.

Operation.—An incision, eight inches long, was made on the outer side of the leg, over the spine of the fibula, through the soft parts covering that bone, and continuing to below the external malleolus. The soft parts were then removed with a sharp bone chisel (which, by the way, is the only proper instrument for this purpose). With this instrument, the soft parts are peeled off from the bone, which may, in many instances, be fully exposed, without any transverse section being made, or risk of wounding adjacent bloodvessels or nerves. And it is the transverse incisions that do the injury in all operations upon the extremities. The mere separation of the tissues amounts to comparatively nothing, let the length of the incisions be what it may in effecting this.

The soft parts being removed, the fibula was fully exposed. It was found much diseased, and in the lower part almost as soft as cartilage. Five inches of the lower extremity were removed, including the external malleolus. The bone was divided above, by a large pair of bone forceps, and its attachments below removed by the chisel.

The bone was somewhat enlarged above the point at which it was divided, but not diseased to a sufficient extent to require removal, it being thought that, by having the part exposed, for the purpose of applying medical substances to it, a final cure would be the result. This plan was accordingly resorted to successfully. A piece of lint was applied to the wound, whence the bone was removed, and a roller put around the limb, as tightly as the patient could well bear it, commencing at the toes. This dressing was kept wet with an evaporating lotion, composed of one part of alcohol and ten of water (the best proportions for our climate), for the first ten days. After which the lotion was exchanged for poultices, which were renewed morning and evening. The lint was removed about the time the poultices were first applied, and the wound permitted to fill by granulations. A weak solution of the tr. iodine was applied in the wound, and over the lower part of the limb. Sometimes this caused pain, and required to be used unremittingly, with other applications, as a weak aqueous solution of ferri potas. tart., black lotion, &c. &c.

The patient took iodide of potassium and ext. of conium the first three months after the operation.

The wound gradually healed by granulation, and the strength of the limb has been slowly restored until the present time, March 30, 1861, eight months after the operation. The little patient walks comparatively well, and is all the time improving, with a prospect of its continuance until a complete cure is effected, with an entire reproduction of the lost bone. The solidity of the parts occupying the place of the lost bone is such as to indicate its reproduction, to a great extent, already. But to those familiar with the immense number of cases in which a large amount of bone has been removed (in California), and afterwards restored by reproduction, the result of this case will not be surprising, but it will be considered rather as a matter of course. While our brethren abroad marvel at the manner in which surgeons of this coast '*play with the bones and joints*,' as they express it, the better informed practitioners of this city regard these almost universally successful results, occurring after the removal of large portions of the shafts of the long bones, as results very naturally to be expected."

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JEFFERSON MEDICAL COLLEGE—1861-2.

The Session will commence on Monday, the 14th of October, with a General Introductory Lecture by one of the Professors. The regular lectures will begin the day after. The Session will terminate on the last day of February.

ROBERT M. HUSTON, M. D.,	Emeritus Professor of Materia Medica and General Therapeutics.
CHARLES D. MEIGS, M. D.,	Emeritus Professor of Obstetrics and Diseases of Women and Children.

Institutes of Medicine, ...	By Prof. ROBLEY DUNGLISON, M. D.
General, Descriptive and Surgical Anatomy, .	" JOSEPH PANCOAST, M. D.
Chemistry, ...	" FRANKLIN BACHE, M. D.
Institutes and Practice of Surgery, . .	" SAMUEL D. GROSS, M. D.
Materia Medica and General Therapeutics, .	" THOMAS D. MITCHELL, M.D.
Practice of Medicine, ...	" S. HENRY DICKSON, M. D.
Obstetrics and Diseases of Women and Children,	" CHARLES D. MEIGS, M. D.

Demonstrator of Anatomy, . . ELLERSLIE WALLACE, M. D.

Clinics will be held regularly during September; and every Wednesday and Saturday in October, and during the course, Medical and Surgical cases will be investigated, prescribed for, and lectured on before the Class. During the year ending March the first, 1861, a vast number of medical and surgical cases were treated, and several hundred surgical operations were performed; among them many of the most important.

The lectures are so arranged as to permit the student to attend the clinics of the Pennsylvania Hospital, and the Philadelphia Hospital.

On and after the 1st of October, the dissecting-rooms will be open, under the direction of the Professor of Anatomy and the Demonstrator.

FEES.

Matriculation, which is paid only once, ...	$ 5
To each Member of the Faculty $15, ...	105
Graduation, ...	30

ROBLEY DUNGLISON, M. D.,
Dean of the Faculty.

HARVARD UNIVERSITY.

MASSACHUSETTS MEDICAL COLLEGE.

The annual course of Medical Lectures of Harvard University will commence at the Massachusetts Medical College, in North Grove Street, Boston, on the first Wednesday of November, 1861. The regular course will be as follows:—

Obstetrics and Med. Jurisprudence,	by Professor	D. HUMPHREYS STORER, M. D.
Morbid Anatomy, ...	" "	JOHN B. S. JACKSON, M. D.
Clinical Medicine, ...	" "	HENRY I. BOWDITCH, M. D.
Anatomy and Physiology, . .	" "	OLIVER W. HOLMES, M. D.
Theory and Practice of Medicine,	" "	GEORGE C. SHATTUCK, M D.
Surgery, ...	" "	HENRY J. BIGELOW, M. D.
Chemistry, ...	" "	JOHN BACON, M. D.
Materia Medica	" "	EDWARD H. CLARKE, M. D.

Demonstrator, DAVID W. CHEEVER, M. D.

Clinical, Medical, and Surgical Instruction will be given at the Massachusetts General Hospital, with Surgical Operations.

Collateral special medical instruction will also be given at the Hospital by Lectures and otherwise, by Drs BOWDITCH, ABBOT, and ELLIS.

Abundant material is afforded for the study of Practical Anatomy. The Room devoted to this department is open day and evening, and lighted by gas.

Fees for the Lectures, $80; Matriculation fee, $3; Graduation fee, $20.

Good Board can be obtained at $2 50 to $5 00 per week. Boarding places provided on application to the Janitor at the College.

Students are requested, upon coming to Boston, to call upon the Dean.

D. HUMPHREYS STORER, *Dean of the Faculty.*
July 1, 1861. *No.* 132 *Tremont Street, Boston.*

BOYLSTON MEDICAL PRIZE QUESTIONS.

The Boylston Medical Committee, appointed by the President and Fellows of Harvard University, consists of the following Physicians:—

Edward Reynolds, M. D.
John Jeffries, M. D.
S. D. Townsend, M. D.
J. B. S. Jackson, M. D.
J. Mason Warren, M. D.
D. H. Storer, M. D.
Charles G. Putnam, M. D.
Morrill Wyman, M. D.
Henry J. Bigelow, M. D.

At a meeting of the Committee on Wednesday, August 7th, 1861, a premium of Sixty Dollars, or a gold medal of that value, was awarded to Richard M. Hodges, M. D., of Boston, for the best dissertation on the question—
Excision of Joints.

No premium was awarded for either of the Dissertations on the question—
Diagnosis and Treatment of Chronic Pleurisy.

The following are the questions proposed for 1862:—

1. *How far does the Microscope assist us in Surgical Diagnosis?*
2. *On Nausea and Vomiting, as Symptoms; under what circumstances do they occur, and what indications do they afford as to the seat and character of disease?*

Dissertations on these subjects must be transmitted, post paid, to Edward Reynolds, M. D., *on or before the first Wednesday of April*, 1862.

The following are the questions proposed for 1863:—

1. *On Trephining the Skull for Injury or Disease.*
2. *On Leucocythæmia.*

Dissertations on these subjects must be transmitted as above, *on or before the first Wednesday* of April, 1863.

The author of the best dissertation considered worthy of a prize on the subjects for 1862, will be entitled to a premium of *sixty dollars*, or a gold medal of that value, at his option.

The author of the best dissertation considered worthy of a prize on either of the subjects proposed for 1863, will be entitled to a premium of *ninety dollars*, or a gold medal of that value.

Each dissertation must be accompanied by a sealed packet, on which shall be written some device or sentence, and within which shall be inclosed the author's name and residence. The same device or sentence is to be written on the dissertation to which the packet is attached.

The writer of each dissertation is expected to transmit his communication to the Chairman of the Committee, in a legible handwriting, within the time specified.

All unsuccessful dissertations are deposited with the Secretary, from whom they may be obtained, with the sealed packet unopened, if called for within one year after they have been received.

By an order adopted in 1826, the Secretary was directed to publish annually the following votes:—

1st. That the Board do not consider themselves as approving the doctrines contained in any of the dissertations to which premiums may be adjudged.

2d. That in case of publication of a successful dissertation, the author be considered as bound to print the above vote in connection therewith.

J. MASON WARREN,
Secretary.

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UNIVERSITY OF PENNSYLVANIA.

MEDICAL DEPARTMENT.

NINETY-SIXTH SESSION, 1861 AND '62.

The regular Lectures of this School will commence Monday, October 14, and terminate the last of February.

Fee for the full Course $105

R. E. ROGERS,
Dean of the Med. Faculty.

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